Specification for: **Charleston Fire Department**	Bidder Complies	
	Yes	No

SPECIFICATIONS FOR A CUSTOM 1500 GPM TRIPLE COMBINATION PUMPER

INTENT OF SPECIFICATIONS

It is the intent of these specifications to cover the furnishing and delivery of a complete fire apparatus. These detailed specifications cover the requirements as to the type of construction and tests to which of the apparatus should conform, together with certain details as to finish, equipment and appliances with which the successful Vendor should conform. Minor details of construction and materials, which are not otherwise specified, are left to the discretion of the Contractor. The Manufacturer should provide loose equipment only when specified by the customer. However, in accordance with the current edition of NFPA 1901 standards, the proposal should specify whether the fire department or apparatus dealership should provide required loose equipment.

In order to ensure fair, ethical, and legal competition, neither original equipment Manufacturer (OEM) nor parent company of the OEM should have ever been fined or convicted of price fixing, proposal rigging, or collusion in any domestic or international fire apparatus market.

Proposals should only be considered from companies that have an established reputation in the field of fire apparatus construction. Further, Vendor should maintain dedicated service facilities for the repair and service of products. Evidence of such a facility should be included in Vendor's proposal.

Each Vendor should furnish satisfactory evidence of their ability to construct the apparatus specified and should state the location of the factory where the apparatus is to be built. The Vendor should also show that the company is in position to render prompt service and to furnish replacement parts.

Each proposal should be accompanied by a detailed set of Contractor's Specifications consisting of a detailed description of the apparatus and equipment proposed, and to which the apparatus furnished under contract should conform. These specifications should indicate size, type, model and make of all component parts and equipment.

QUALITY AND WORKMANSHIP

The design of the apparatus should embody the latest approved automotive engineering practices. The workmanship should be of the highest quality in its respective field. Special consideration should be given to the following points: Accessibility to various components that require periodic maintenance; ease of operation (including both pumping and driving); and symmetrical proportions. Construction should be rugged and ample safety factors should be provided to carry the loads specified and to meet both on and off road requirements and speed conditions as set forth under Performance Tests and Requirements. Welding should not be employed in the assembly of the

apparatus in a manner that should prevent the ready removal of any component part for service or repair. All steel welding should follow American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding should follow American Welding Society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding should follow American Welding Society B2.1-2000 requirements for structural welding of sheet metal. Flux core arc welding to use alloy rods, type 7000, American Welding Society standards A5.20-E70T1. Employees classified as welders are tested and certified to meet American Welding Society codes upon hire and every three (3) years thereafter. The Manufacturer should be required to have an American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

Pop-rivets, self-tapping screws or sheet metal screws should not be used in any applications throughout this unit without prior approval of the Charleston Fire Department. Attaching devices should be approved by the Charleston Fire Department.

INFORMATION REQUIRED

The Manufacturer should supply at time of delivery, complete operation and maintenance manuals covering the completed apparatus as delivered. A permanent plate should be mounted in the driver's compartment which specifies the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

PERFORMANCE TESTS AND REQUIREMENTS

A road test should be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more should be made under all driving conditions, during which time the apparatus should show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles should run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. Vehicle should adhere to the following parameters:

A) The apparatus, when fully equipped and loaded, should have not less than 25 percent and nor more than 50 percent of the weight on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle.

B) The apparatus should be capable of accelerating to 35 mph from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed rpm of the engine.

C) The service brakes should be capable of stopping a fully loaded vehicle in 35 feet at 20 mph on a level concrete highway. The air brake system should conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.

D) The apparatus, fully loaded, should be capable of obtaining a speed of 50 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).

FAILURE TO MEET TEST

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, second trials may be made at the option of the Vendor within 30 days of the date of the first trial. Such trials should be final and conclusive and failure to comply with these requirements should be cause for rejection. Failure to comply with changes to conform to any clause of the specifications, within 30 days after notice is given to the Vendor of such changes, should also be cause for rejection of the apparatus. Permission to keep or store the apparatus in any building owned or occupied by the purchaser or its use by the purchaser during the above-specified period with the permission of the Vendor should not constitute acceptance.

LIABILITY

The successful Vendor should defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.

SPECIFICATION PROPOSAL REQUIREMENTS

Vendors should also indicate in the "Yes/No" column if their proposal complies on each item/paragraph specified. Exceptions should be allowed if they are equal to or superior to that specified and provided they are listed and fully explained on a separate page. Any deviation from specifications must be explained at detail. Any deviation from the specifications will be graded on.

Also, Vendors should submit a detailed proposal. A letter only, even though written on a company letterhead, should not be sufficient.

EXCEPTIONS

All exceptions should be stated no matter how seemingly minor. Any exceptions not taken should be assumed by the purchaser to be included in the proposal, regardless of the cost to the Vendor.

GENERAL CONSTRUCTION

The apparatus should be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution should be in accordance with the recommendations of the National Fire Protection Association.

COMMERCIAL GENERAL LIABILITY INSURANCE

The Contractor should maintain liability insurance as listed in Attachment B.

SINGLE SOURCE MANUFACTURER

Bids should only be accepted from a single source apparatus manufacturer. The definition of single source is a manufacturer that designs and manufactures their products using an integrated approach, including the chassis, cab, pump house and body. The warranties relative to the chassis and body design (excluding component warranties such as engine, transmission, axles, pump, etc.) must be from a single source manufacturer and not split

between manufacturers (i.e. body and chassis). The bidder should provide evidence that they comply with this requirement.

NFPA 2009 STANDARDS

This unit should comply with the NFPA standards effective January 1, 2009, except for fire department specifications that differ from NFPA specifications. These exceptions should be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces should be supplied with delivery of the apparatus.

A plate that is highly visible to the driver while seated should be provided. This plate should show the overall height, length, and gross vehicle weight rating.

The Manufacturer should have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company should designate, in writing, who is qualified to witness and certify test results.

NFPA COMPLIANCE

Apparatus proposed by the Vendor should meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications should be indicated in the proposal as "non-NFPA".

TOTAL VEHICLE ASSESSMENT CERTIFICATION

The apparatus should be third party, independent, audit-certified through Underwriters Laboratory (UL) to the current edition of NFPA 1901 standards. The certification includes: all design, production, operational, and performance testing of the apparatus.

PUMP TEST

The pump should be tested, approved, and certified by Underwriter's Laboratory at the Manufacturer's expense. The test results and the pump Manufacturer's certification of hydrostatic test; the engine Manufacturer's certified brake horsepower curve; and the Manufacturer's record of pump construction details should be forwarded to the Charleston Fire Department.

PERFORMANCE BOND

A 100% performance bond will be required by the vendor awarded this RFP.

PROPOSAL DRAWING

A drawing of the proposed apparatus should be provided in the bid proposal for review.

APPROVAL DRAWING

A drawing of the proposed apparatus should be provided for approval before construction begins. The sales representative should also have a copy of the

same drawing. The finalized and approved drawing should become part of the contract documents. This drawing should indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus should be prepared and submitted by the Manufacturer to the purchaser showing any changes made to the approval drawing.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, should be provided.

CONSTRUCTION PROGRESS PHOTOS

The successful Vendor should provide weekly photographs of the apparatus or the major components as they are being constructed. The photos should commence at the beginning of the manufacturing process and should continue until just prior to the final inspection. There should be approximately six (6) weekly reports illustrating the progress of the apparatus through the course of each week. Special attention should be given to show the unique features and aspects of the apparatus as construction progresses.

CUSTOMER REFERENCE LIST

A customer reference list should be provided with each bid. The reference list should include a minimum of ten (10) Departments (5 within South Carolina and 5 within Georgia & North Carolina) who currently operate the brand of apparatus being proposed. Reference information should include but not limited to department name, contact information and make/model of apparatus in service.

SOUTH CAROLINA DEALER LICENSE

Each Vendor must provide with proposal a valid and current copy of their South Carolina Dealer License as issued by the South Carolina Department of Motor Vehicles.

This license requirement is to assure the Vendor is legally authorized to engage in the sale of motor vehicles within the State of South Carolina.

LOCAL SERVICE FACILITY

Each Vendor must provide with proposal proof of dealer owned and operated Service Facility located within 300 miles of Charleston, SC along with factory trained service personnel. Service personnel should be factory trained to handle parts and warranty repair for their respective Manufacturer.

In addition, local Service Facility must have the capability to dispatch factory trained service technicians with dealer operated mobile service units to Department location for field service repairs.

PRE-CONSTRUCTION CONFERENCE

Prior to any construction of apparatus a pre-construction conference should be held at the Manufacturers facility for four (4) Department personnel to review

approval drawing package. Motel, meals and travel should be the responsibility of the successful Vendor for no more than 2 nights. The sales representative should be present and assist in the conference.

MID-POINT INSPECTION

A mid-point inspection should be provided at the Manufacturer's facility to assess the progress of the apparatus construction and ensure the apparatus is being constructed according to the specification. Motel, meals and travel expenses for four (4) Department personnel should be the responsibility of the successful Vendor for no more than 2 nights. The sales representative should be present and assist in the inspection process.

FINAL INSPECTION

A final inspection should be provided at the Manufacturer's facility for inspection of the completed unit. Motel, meals and travel expenses for four (4) Department personnel should be the responsibility of the successful Vendor for no more than 2 nights. The sales representative should be present and assist in the inspection process.

DELIVERY

The completed apparatus should be delivered to the Charleston Fire Department under its own power to insure proper break in of all components while still under warranty. Rail or truck freight should not be acceptable. A qualified delivery engineer representing the Vendor/Manufacturer should deliver the apparatus to a location designated by the Charleston Fire Department.

TRAINING AND FAMILIARIZATION

The Vendor/Manufacturer should provide the following training/familiarization as part of the purchase:

- Apparatus Operation: Minimum three (3) days at or about the time of delivery to familiarize department officers and drivers on the vehicle's operating characteristics. The apparatus must be present for the training.
- Mechanical: If the apparatus is multiplexed, the Vendor/Manufacturer should provide travel, lodging and enrollment for one (1) Charleston Fire Department service technician to attend the Vendor/Manufacturer's multiplex training class.

CHASSIS

Chassis provided should be a new, tilt-type, custom fire apparatus. The chassis should be manufactured in the apparatus body builder's facility, thus eliminating any split responsibility. The chassis should be designed and manufactured for heavy-duty service with adequate strength and capacity to sustain the intended load and the type of service required.

WHEELBASE

The wheelbase of the vehicle should not exceed 184.50 inches.

GVW RATING
The gross vehicle weight rating should be a minimum of 45,740 pounds.

FRAME
The chassis frame should be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus.

FRONT AXLE
The front axle should be a reverse "I" beam type with inclined kingpins. It should be a Meritor™ axle, Model FL-943, with a rated capacity of 18,740 pounds.

The turning angle should be 45 degrees or greater, per the specified axles, wheels and tires.

A viewing window should be provided on each side of the axle for checking the oil level.

FRONT SUSPENSION
Front springs should be a heavy-duty, taper leaf design, 54.00" long by 4.00" wide, with a ground rating of 19,000 lb.

SHOCK ABSORBERS
Heavy-duty telescoping shock absorbers should be provided on the front axle.

OIL SEALS
Oil seals with viewing window should be provided on the front axle.

FRONT TIRES
The front tires should be Michelin 385/65R22.50 radials, 18 ply XFE wide base tread.

The tires should be mounted on Alcoa 22.50" x 12.25" polished aluminum disc-type wheels with a ten (10)-stud, 11.25" bolt circle.

REAR AXLE
The rear axle should be a Meritor™, Model RS-25-160, with a capacity of 27,000 lb.

TOP SPEED OF VEHICLE
A rear axle ratio should be furnished to allow the vehicle to reach a top speed of 65 MPH.

REAR SUSPENSION
The rear springs should be semi-elliptical, 3.00" x 52.00", 12 leaves main with a ground rating of 27,000 lb. Spring hangers should be castings with provisions for lubrication. The grease fittings should be 90-degree type and should be accessible without removing the wheels or cutting any sheet metal. Two (2) top leaves should wrap the forward spring hanger pin and the top leaf should wrap the rear spring hanger pin on both the front and rear suspensions.

OIL SEALS
Oil seals should be provided on the rear axle.

REAR TIRES
Rear tires should be four (4) Michelin 12R22.50 radials, 16 ply "all position" XZY 3 tread.

The tires should be mounted on Alcoa 22.50" x 8.25" polished aluminum disc wheels with a ten (10)-stud 11.25" bolt circle.

LUG NUT COVERS
Chrome plated lug nut covers should be installed on all lug nuts.

TIRE BALANCE
All tires should be balanced with Counteract balancing beads. The beads should be inserted into the tire and eliminate the need for wheel weights.

TIRE PRESSURE MANAGEMENT
There should be a tire alert pressure management system provided that should monitor each tire's pressure. A chrome plated brass sensor should be provided on the valve stem of each tire for a total of six (6) tires.

The sensor should calibrate to the tire pressure when installed on the valve stem for pressures between 20 and 120 psi. The sensor should activate an integral battery operated LED when the pressure of that tire drops eight (8) psi.

Removing the cap from the sensor should indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED should immediately start blinking.

HUB PILOTED WHEELS
Hub piloted wheels should be provided.

HUB COVERS (front)
Stainless steel hub covers should be provided on the front axle. An oil level viewing window should be provided.

MUD FLAPS
Mud flaps should be installed behind the front and rear wheels of the apparatus.

ANTI-LOCK BRAKE SYSTEM
The vehicle should be equipped with a Wabco 4S4M, anti-lock braking system. The ABS should provide a four (4) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology should control the anti-lock braking system. Each wheel should be monitored by the system. When any particular wheel begins to lockup, a signal should be sent to the control unit. This control unit then should reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system should eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

ANTI-LOCK BRAKE SYSTEM WARRANTY
The Wabco ABS system should come with a three (3) year or 300,000 mile parts and labor warranty provided by Meritor Wabco Vehicle Control Systems.

BRAKES
The service brake system should be full air type by Meritor™.

Front brakes should be 16.50 X 6.00 cam operated with automatic slack adjusters with heavy-duty cast shoes with severe service shoes.

The rear brakes should be 16.50" x 7.00" S cam operated with automatic slack adjusters with heavy-duty cast shoes with severe service shoes.

AIR COMPRESSOR, BRAKE SYSTEM
The air compressor should be a Cummins/Wabco with 18.7 cubic feet per minute output.

BRAKE SYSTEM
The brake system should include:

- Bendix-Westinghouse dual brake treadle valve with vinyl covered foot surface

- A heated automatic moisture ejector on air dryer

- Total air system capacity of 4,362 cubic inch

- Two (2) air pressure gauges with red warning light and audible alarm, that activates when air pressure falls below 60 psi

- Bendix spring set parking brake system

- Parking brake operated by a Bendix-Westinghouse PP-1 control valve

- A parking "brake on" indicator light on instrument panel

- Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, should be provided with an automatic spring brake application at 40 psi

The air tank should be primed and painted to meet a minimum 750hour salt spray test.

To reduce the effects of corrosion, the air tank should be mounted with stainless steel brackets.

- Wabco System Saver 1200 air dryer with spin-on coalescing filter cartridge

- 100Watt Heater

BRAKE LINES
Color-coded nylon brake lines should be provided. The lines should be wrapped in a heat protective loom where necessary in the chassis.

AIR SYSTEMS FITTINGS
All air systems fittings should be brass compression fittings

AIR INLET
One (1) air inlet with male coupling should be provided. It should allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet should be located in the driver side lower step well of cab. A check valve should be provided to prevent reverse flow of air. The inlet should discharge into the "wet" tank of the brake system. A mating female coupling should also be provided with the loose equipment.

AUTOMATIC MOISTURE EJECTOR(S)
Three (3) automatic moisture ejectors should be installed in the brake system.

The moisture ejector(s) should be provided on the standard location reservoir(s).

ENGINE
An electronically controlled engine as described below should power the chassis:

Make:	Cummins
Model:	ISL9
Power:	400-450hp at 2100 rpm
Torque:	1250 lb.-ft. at 1400 rpm
Governed Speed:	2200 rpm
Emissions Level:	EPA 2010
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	543 cubic inches (8.9L)
Starter:	Compatible with engine size.
Fuel Filters:	Spin-on style primary filter with water separator & water-in-fuel sensor. Secondary spin-on style filter.
Coolant Filter:	Spin-on style with shut off valves on the supply and return line.

HIGH IDLE

A high idle switch should be provided, inside the cab, on the instrument panel, that should automatically maintain a preset engine rpm. A switch should be installed, at the cab instrument panel, for activation/deactivation. The high idle should be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light should be provided, adjacent to the switch. The light should illuminate when the above conditions are met. The light should be labeled "OK to Engage High Idle."

ENGINE BRAKE
A Jacobs engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver should be able to turn the engine brake system on/off and have a high and low setting.

The engine brake should be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

The ABS system should automatically disengage the auxiliary braking device, when required.

FAN CLUTCH
Fan Clutch should cycle as designed.

ENGINE AIR INTAKE
The air intake with an ember separator should be mounted high on the passenger side of the cab, to the front of the crew cab door. The ember separator is designed to prevent road dirt and recirculating hot air from entering the engine.
The ember separator should be easily accessible through a hinged stainless steel grille, with one (1) flush quarter turn latch. Engine air filter should be mounted above the frame rails.

EXHAUST SYSTEM
The exhaust system should be stainless steel from the turbo to the inlet of the selective catalytic reduction (SCR) device, and should be 4.00" in diameter. The exhaust system should include a diesel particulate filter (DPF) and an SCR device to meet current EPA standards. An insulation wrap should be provided on all exhaust pipe between the turbo and SCR to minimize the transfer of heat to the cab. The exhaust should terminate horizontally ahead of the passenger side rear wheels. A tailpipe diffuser should be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields should be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

EXHAUST MODIFICATION
The exhaust pipe shall be brought out from under the body at a 90 degree angle from the truck. The tail pipe shall extend a minimum of 2.00" past the body, adaptable for the Plymovent tailpipe adapter conical. The Plymovent tailpipe adapter conical must be in place before apparatus is delivered. **(No Exception)** There shall be a clearance of 4.00" completely around the pipe once past the side of the body.

RADIATOR
The radiator and the complete cooling system should meet or exceed NFPA and engine Manufacturer cooling system standards.

For maximum cooling performance, the radiator core should be made of copper fins having a serpentine design, soldered to brass tubes. The tubes should be welded to brass headers using the patented Beta-Weld process for increased strength, longer road life and solder-bloom corrosion protection. The radiator core should have a minimum frontal area of 1396 square inches. Steel supply and return tanks should be bolted to the core headers and steel side channels to complete the radiator assembly. The radiator should be compatible with commercial antifreeze solutions.

The radiator should be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly should be isolated from the chassis frame rails with rubber isolators.

The radiator should include an integral deaeration tank, with a remote-mounted overflow tank. For visual coolant level inspection, the radiator should have a built-in sight glass. The radiator should be equipped with a 15psi pressure relief cap.

A drain port should be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

A heavy-duty fan should draw in fresh, cool air through the radiator. Shields or baffles should be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Gates, or Goodyear, rubber hose should be used for all engine coolant lines installed by the chassis Manufacturer.

Hose clamps should be stainless steel constant torque type to prevent coolant leakage. They should react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

FUEL TANK

A 60-75 gallon fuel tank should be provided and mounted at rear of chassis. The tank should be constructed of 12-gauge, hot rolled steel. It should be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank should be mounted with stainless steel straps.

A .75" drain plug should be provided in a low point of the tank for drainage.

A fill inlet should be located on the left hand side of the body and be covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

A .50" diameter vent should be provided running from top of tank to just below fuel fill inlet.

The tank should meet all FHWA 393.67 requirements including a fill capacity of 95 percent of tank volume.

All fuel lines should be provided as recommended by the engine Manufacturer.

DIESEL EXHAUST FLUID TANK

A 4.5 gallon diesel exhaust fluid (DEF) tank should be provided and mounted on the apparatus. The tank should be constructed of 16-gauge type 304- L stainless steel.

A .50" drain plug should be provided in a low point of the tank for drainage.

A fill inlet should be provided and marked "Diesel Exhaust Fluid Only". The fill inlet should be located adjacent to the engine fuel inlet behind a common hinged, spring loaded, stainless steel door on the driver side of the vehicle.

The tank should meet the engine Manufacturers requirement for 10 percent expansion space in the event of tank freezing.

The tank should include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

TRANSMISSION

An Allison Gen IV, model EVS 3000P, electronic torque converting automatic transmission should be provided.

The transmission should be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display should indicate when service is due.

Two (2) PTO openings should be located on left side and top of converter housing (positions 9 o'clock and 3 o'clock).

A transmission temperature gauge with red light and audible alarm should be installed on the cab dash.

TRANSMISSION SHIFTER

A six (6)-speed push button shift module should be mounted to right of driver on console. Shift position indicator should be indirectly lit for after dark operation.

The transmission ratio should be 1st - 3.49 to 1.00, 2nd - 1.86 to 1.00, 3rd - 1.41 to 1.00, 4th - 1.00 to 1.00, 5th - 0.75 to 1.00, 6th - 0.65 to 1.00, R - 5.03 to 1.00.

TRANSMISSION COOLER

A transmission oil cooler should be provided in the lower tank of the radiator.

DRIVELINE

Drivelines should be a heavy-duty metal tube and be equipped with Spicer 1710 universal joints.

The shafts should be dynamically balanced before installation.

A splined slip joint should be provided in each driveshaft, slip joint should be coated with Glidecoat or equivalent.

STEERING

A Ross TAS-85 steering gear, with integral heavy-duty power steering, should be provided. For reduced system temperatures, the power steering should incorporate an air to oil cooler and a TRW model EV hydraulic pump with integral pressure and flow control. All power steering lines should have wire braded lines with crimped fittings.

A tilt and telescopic steering column should be provided to improve fit for a broader range of driver configurations.

STEERING ASSIST CYLINDER ON FRONT AXLE

The front axle should be equipped with a Ross power assist cylinder to aid in the steering of the apparatus.

STEERING WHEEL

The steering wheel should be a minimum18.00" in diameter have tilting and telescoping capabilities, and a four (4)-spoke design.

BUMPER

A one (1) piece bumper manufactured from a minimum .25" formed steel with a minimum .38" bend radius should be provided. The bumper should be a minimum of 10.00" high with a 1.50" top and bottom flange, and should extend 19.00" from the face of the cab. The bumper should be 95.28" wide with 45 degree corners and side plates. The bumper should be metal finished and painted job color.

To provide adequate support strength, the bumper should be mounted directly to the front of the C channel frame.

GRAVEL PAN

A gravel pan, constructed of bright aluminum tread plate, should be furnished between the bumper and the cab face. The pan should be properly supported from the underside to prevent flexing and vibration.

LIFT AND TOW MOUNTS

Mounted to the frame extension should be lift and tow mounts. The lift and tow mounts should be designed and positioned to adapt to certain tow truck lift systems.

The lift and tow mounts with eyes should be painted the same color as the frame.

HOSE TRAY

A hose tray, constructed of aluminum, should be placed in the center of the bumper extension.

The tray should have a capacity of 150' of 1.75" double jacket cotton-polyester hose and 1.50” pistol grip style nozzle.

Black rubber grating should be provided at the bottom of the tray. Drain holes are also provided. The front outlet to be plumbed toward passenger side of tray.

GRAVEL PAN

A gravel pan, constructed of bright aluminum tread plate, should be furnished between the bumper and cab face.

The gravel pan should be properly supported from the underside to prevent flexing and vibration of the aluminum tread plate.

HOSE TRAY COVER

A bright aluminum tread plate cover should be provided over the one (1) hose tray. The cover should be raised 1.50" above the gravel pan.

The cover should be attached with a stainless steel hinge and located bumper hose tray.

A lift and turn latch should secure the cover in the closed position and a pneumatic stay arm should hold the cover in the open position.

CAB

The cab should be designed specifically for the fire service and should be manufactured by the chassis builder.

The manufacturer must list the model of cab.

Construction of the cab should consist of 5052-H32 .125" aluminum welded to extruded aluminum framing or a comparable material.

The cab should be 94.00"-99.00” wide with an interior minimum width of 87.50". A minimum of 67” should be provided from the center of the front axle to back of cab.

The overall height (from the cab roof to the ground) should be approximately 103.00". The overall height listed should be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension should increase the overall height listed.

The crew cab should be of the totally enclosed design with access doors constructed in the same manner as the driver and passenger doors.

The cab should be a flat roof, full tilt style. The engine should be easily accessible and capable of being removed with the cab tilted. The cab should be capable of tilting 45 degrees and 90 degrees with crane assist.

The cab should have a three (3)-point rubber mounting and should be tilted by a hydraulic pump connected to two (2) cab lift cylinders. The cab should then be

locked down by a two (2)-point automatic locking mechanism that actuates after the cab has been lowered.

INTERIOR CAB INSULATION
The cab should include 1.50" insulation in the ceiling and side walls, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

ENGINE TUNNEL
Engine hood sidewalls should be constructed of .50" aluminum. The top should be constructed of .19" aluminum and should be tapered at the top to allow for more driver and passenger elbowroom.

The engine hood should be insulated for protection from heat and sound. The noise insulation keeps the DBA level within the limits stated in the current NFPA series 1900 pamphlet.

FENDER LINERS
Full circular inner fender liners in the wheel wells should be provided.

REAR WALL COVERING
Bright aluminum tread plate should be overlaid on the outside rear wall of the crew cab except for areas that are not typically visible when the cab is lowered.

WINDSHIELD
A curved safety glass, two-piece windshield should be provided with a minimum of 2,754 square inches of clear viewing area. The cab windshield should have bright trim inserts in the rubber molding holding the glass in place. Economical windshield replacement glass should be readily available from local auto glass suppliers.

All cab glass should be tinted.

SUNVISORS
Two (2) smoked sun visors should be provided. The sun visors should be located above the windshield with one (1) mounted on each side of the cab.

WINDSHIELD WIPERS
Two (2) electric windshield wipers with washer should be provided that meet FMVSS and SAE requirements.

The washer reservoir should be able to be filled without raising the cab.

A glove box with a drop-down door should be installed in the front dash panel in front of the officer position.

CAB LIFT
A hydraulic cab lift system should be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

The hydraulic pump should have a manual override for backup in the event of electrical failure. The manual override should be located at the passenger side pump panel behind a polished s/s door.

Lift controls should be on a panel located on the pump panel or front area of the body in a convenient location.

Cab should be locked down by a two (2)-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The hydraulic cylinders should be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position.

For increased safety, a redundant mechanical stay arm should be provided that must be manually put in place on the driver side between the chassis and cab frame when the cab is in the raised position. This device should be manually stowed to its original position before the cab can be lowered.

INTERLOCK, CAB LIFT TO PARKING BRAKE

The cab lift system should be interlocked to the parking brake. The cab tilt mechanism should be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released the cab tilt mechanism should be disabled.

SCUFFPLATE

An aluminum four-way scuff plate should be provided on the rear of engine tunnel, vertical surface. Scuff plate should be full width and full height.

STRIPE (On Paint Break)

There should be a gold leaf stripe provided on the paint break in place of chrome molding. The stripe should be on both sides of the cab and on the cab face with shield.

MIRRORS

A west coast mirror should be mounted on each side of the front cab door. Mirror dimensions should be 7.00" wide x 16.00" high, and should be heated. The passenger mirror will be motorized. The driver side mirror will be manual. The shell should be bright annealed stainless steel.

The mirror for the passenger side should have a remote control that is convenient to the driver. The cab mirrors should be lowered to avoided contact of striking arch

SIDE VIEW MIRROR

An 8.00" diameter convex mirror should be provided over the officer's side front corner of the cab. The mirror should provide the driver with a view of the passenger side of the vehicle.

The mirror housing, tubing, clamps and hardware should be constructed of corrosion resistant stainless steel.

The west coast mirror heads should be mounted with two (2) side mount brackets in place of top and side mount brackets.

CONVEX MIRRORS

A 6.00" diameter round convex mirror should be installed below each west coast mirror head.

DOORS

The crew cab doors should be located on the sides of the cab and should be constructed in the same manner as the forward cab doors. The forward cab and crew cab doors should be constructed of extruded aluminum with a nominal material thickness of .125". The exterior door skins should be constructed from .090" aluminum or a comparable material. All doors should be barrier style.

All cab and crew cab entry doors should contain a conventional roll down window.

A flush mounted, chrome plated paddle type door handle should be provided on the exterior of each cab door. Each door should also be provided with an interior flush paddle handle.

The cab doors should be provided with both interior (rotary knob) and exterior (keyed) locks as required by FMVSS 206. The locks should be capable of activating when the doors are open or closed. The doors should remain locked if locks are activated when the doors are opened, then closed.

A full length, heavy duty, stainless steel, piano-type hinge with a .38" pin and 11 gauge leaf should be provided on all cab doors. There should be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

Full height polished stainless steel scuff plates should be installed on the inside of all cab doors. Cab door panels should be removable without disconnecting door and window mechanisms.

A chrome handrail should be provided on the inside each front cab door, for ease of entry.

The cab steps at each door location should be located below the cab doors and should be exposed to the exterior of the cab.

CAB STEPS

The forward cab and crew cab access steps should be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps should be designed with a grip pattern punched into bright aluminum tread plate material to provide support, slip resistance, and drainage. The bottom steps should be a bolt-in design to minimize repair costs should they need to be replaced. The inside cab steps should not exceed 18.00" in height and be limited to two (2) steps. Three (3) step entrance designs should not be acceptable due to safety concerns. A slip-resistant handrail

should be provided adjacent to each cab door opening to assist during cab ingress and egress.

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there should be four (4), LED, step lights provided. The lights should be installed at each cab and crew cab door, one (1) per step, in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

The lights should be activated when the adjacent door is opened.

FENDER CROWNS

Stainless steel fender crowns should be installed at the cab wheel openings. The fender crowns should have a radius outside corner that allows the fender crown to extend beyond the side wall of the front tires and also allow the crew cab doors to open fully.

CREW CAB WINDOWS

One (1) fixed window with tinted glass should be provided on each side of the cab, to the rear of the front cab door. The windows should be sized to enhance light penetration into the cab interior. The windows should measure approximately 17.50" wide x 21.00" high.

The rear wall of the crew cab should have two (2) windows, each being approximately 11.29" wide x 17.95" high.

CAB INTERIOR

The cab dash fascia should be a flat faced design to provide easy of maintenance and should be constructed out of painted aluminum.

The engine tunnel should be padded and covered with 46-ounce leather grain vinyl resistant to oil, grease and mildew.

The headliner should be installed in both forward and rear cab sections. Headliner material should be vinyl. A sound barrier should be part of its composition. Material should be installed on aluminum sheet or a comparable material and securely fastened to interior cab ceiling.

Forward portion of cab headliner should provide easy access for servicing electrical wiring or for other maintenance needs without removing the entire unit.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery should be red.

INTERIOR PAINT (Cab)

The cab interior metal surfaces should be painted red, vinyl texture paint.

CAB FLOOR
The cab and crew cab flooring should be constructed with bright aluminum tread plate.

CAB DEFROSTER
There should be a 41,000 BTU/hr. defroster in the cab located under the engine tunnel.

The defroster ventilation should be built into the design of the cab dash instrument panel and should be easily removable for maintenance.

The defroster should have a three (3)-speed blower and temperature controls accessible to the driver and officer.

The defroster ducts should be designed to provide maximum defrosting capabilities for the front cab windows.

CAB/CREW CAB HEATER
Two (2) auxiliary heaters with 32,000 BTU/hr. each should be provided in the cab. The heaters should have a three (3)-speed blower and temperature controls accessible to the driver and officer. There should also be louvers located below the rear facing seat riser and below the driver and officer positions for airflow.

The heaters should be mounted, one (1) within each rear facing seat riser.

AIR CONDITIONING
A high-performance, customized air conditioning system should be furnished inside the cab and crew cab. A 19.10 cubic inch compressor should be installed on the engine.

The air conditioning system should be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling performance test should be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of four (4) hours.

A roof-mounted condenser that meets and exceeds the performance specification should be installed on the cab roof. Mounting the condenser below the cab or body would reduce the performance of the system and should not be acceptable.

An evaporator unit that meets and exceeds the performance specification should be installed in the cab, located in the center of the cab ceiling over the engine tunnel. The evaporator should include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

The evaporator unit should be provided with adjustable air outlets strategically located to direct air flow to the driver, officer and crew cab area.

All hose used should be class 1 type to reduce moisture ingression into the air conditioning system.

The air conditioner refrigerant should be R-134A and should be installed by a certified technician.

A single electronic control panel should control the air conditioner. For ease of operation, the control panel should include variable adjustment for temperature and fan control and be conveniently located on the dash in clear view of the driver. The control panel should include robust knobs for both fan speed and temperature adjustment. The housing protecting the air conditioning unit in the center of the cab will be painted black to match the roof.

GRAB HANDLE

A grab handle should be mounted on the lower portion of the driver's side cab entrance to assist in entering the cab. The grab handle should be securely mounted to the post area between the door and steering wheel column.

A long grab handle should be mounted on the dashboard in front of the officer.

GLOVE BOX

A glove box with a drop-down door should be installed in the front dash panel in front of the officer position. The top part should be flat for an MDT mount.

CAB MAP LIGHTS

One (1) Gooseneck map light should be installed on top flat part of glove box and should not interfere with MDT mount.

ENGINE COMPARTMENT LIGHT

An engine compartment light should be installed under the engine hood, of which the switch is an integral part. Light should have a .125" diameter weep hole in its lens to prevent moisture retention.

ACCESS TO ENGINE DIPSTICKS

For access to the engine oil and transmission fluid dipsticks, there should be a door on the engine tunnel, inside the crew cab. The door should be on the rear wall of the engine tunnel, on the vertical surface, flush with the wall of the engine tunnel.

The engine oil dipstick should allow for checking only. The transmission dipstick should allow for both checking and filling. An additional tube should be provided for filling the engine oil.

The door should have a rubber seal for thermal and acoustic insulation. One (1) flush latch should be provided on the access door.

SEATING CAPACITY

The seating capacity in the cab should be five (5).

DRIVER SEAT

A seat should be provided in the cab for the driver. The seat design should be a cam action type, with air suspension. For increased convenience, the seat should include a manual control to adjust the horizontal position. The manual horizontal control should be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat should have an adjustable reclining back. The seat back should be a high back style with side bolster pads for maximum support. The seat should be furnished with a three (3)-point, shoulder type seat belt. The seat belt tongue should be stored at waist position for quick application by the seat occupant. The seat belt receptacle should be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt should be furnished with dual automatic retractors that should provide ease of operation in the normal seating position.

OFFICER SEAT

A seat should be provided in the cab for the passenger. The seat should be a fixed type, with no suspension. To ensure safe operation, the seat should be equipped with seat belt sensors in the seat cushion and belt receptacle that should activate an alarm indicating a seat is occupied but not buckled.

The seat back should be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity should be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity should be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat should be furnished with a three (3)-point, shoulder type seat belt. The seat belt tongue should be stored at waist position for quick application by the seat occupant. The seat belt receptacle should be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt should be furnished with dual automatic retractors that should provide ease of operation in the normal seating position.

RADIO COMPARTMENT

A radio compartment should be provided under the officer's seat.

The inside compartment dimensions should be approximately 14.50" deep x 14.50" across x 9.00" high.

Access to this compartment should be through a side door that hinges downward. Door should be secured with a flush locking latch.

The compartment should be constructed of smooth aluminum and painted to match the cab interior.

FORWARD FACING CENTER SEATS

There should be three (3) forward facing seats provided at the center position in the crew cab. To ensure safe operation, the seats should be equipped with seat

belt sensors in the seat cushion and belt receptacle that should activate an alarm indicating a seat is occupied but not buckled.

The seat back should be an SCBA style with 90 degree back. The SCBA cavity should be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity should be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seats should be furnished with three (3)-point shoulder type seat belts. The seat belt tongue should be stored at waist position for quick application by the seat occupant. The seat belt receptacle should be provided on a cable conveniently nested next to the seat cushion providing easy accessibility. The seat belts should be furnished with dual automatic retractors that should provide ease of operation in the normal seating position.

SEAT UPHOLSTERY

All Seats Inc. 911 seat upholstery should be maroon woven with black Imperial 1200 material.

SCBA HOLDERS

All SCBA type seats in the cab should have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket should include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp should constrain the SCBA bottle in the seat and should exceed the NFPA standard of 9G. Bracket designs with manual restraints (belts, straps, buckles) that could be inadvertently left unlocked and allow the SCBA to move freely within the cab during an accident should not be acceptable.

There should be a quantity of four (4) Smart Dock Gen II hands free SCBA holders.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with three (3)-point shoulder type seat belts should include a height adjustment. This adjustment should optimize the belts effectiveness and comfort for the seated firefighter.

SEAT BELTS

All seating positions in the cab and crew cab should have red seat belts. Seat belt receptacle extensions for driver and officer should be provided. **(No Exception)**

SEAT BELT MONITORING SYSTEM

A seat belt monitoring system (SBMS) should be provided. The SBMS should be capable of monitoring up to ten (10) seat positions indicating the status of each seat position with a green or red LED indicator as follows:

Driver Seat:

Seat Occupied Buckled Green

No Occupant Unbuckled Not Illuminated

The driver seat should not include an occupant sensor. The display indication for the driver seat should illuminate red any time the parking brake is released and the driver seat belt is not buckled.

All Other Seats:

Seat Occupied Buckled Green

Seat Occupied Unbuckled Red

No Occupant Buckled Red

No Occupant Unbuckled Not Illuminated

Alarm
The SBMS should include an audible alarm that should be activated when a red illumination condition exists and the parking brake is released, or a red illumination condition exists and the transmission is not in park.

HELMET HOLDER
There should be One (1) Zico UHH-1 helmet holder bracket(s) provided in the cab. The brackets should provide quick access and secure storage of the helmet(s). The bracket location(s) should be determined at time of final inspection.

CAB INTERIOR LIGHTING
Auxiliary lights should be provided in the cab and consisting of:

- Two (2) Weldon, Model 8081, red/clear dome light located, one (1) on the officer side and one (1) on the driver side, controlled by the following:

  Clear forward light controlled by the door switch and the lens switch.

  Red rearward light controlled by the lens switch.

- Two (2) Adjustable Map Lights: With switches mounted on the cab ceiling.

CREW CAB INTERIOR LIGHTING
There should be two (2) Weldon, Model 8081-0000-13, incandescent dome lights with grey bezels installed in the crew cab located one (1) each side, controlled by the following:

- The forward, clear light should be controlled by the door switch and the lens switch.
- The rear, red light should be controlled by the lens switch only.

A courtesy light at each door opening, controlled by automatic door switches.

HAND HELD SPOTLIGHT
There should be one (1) spotlight provided, Model Collins CL-12, with a 9 foot coil cord and momentary switch. The housing should be made from aircraft

aluminum that is black powder coated. Location of the one (1) spotlight should be on engine tunnel driver side, just to the rear of the drivers seat (hard wired & mounted with rubber clips).

CAB INSTRUMENTATION

The cab instrument panel should include gauges, telltale indicator lamps, control switches, alarms, and a diagnostic panel. A label adjacent to each item should identify the function of the instrument panel controls and switches. Actuation of the headlight switch should illuminate the labels in low light conditions. Telltale indicator lamps should not be illuminated unless necessary. The cab instruments and controls should be conveniently located within the forward cab section, forward of the driver. The gauge assembly and switch panels are designed to be removable for ease of service and low cost of ownership.

GAUGES

The gauge panel should include the following ten (10) black faced gauges with black bezels to monitor vehicle performance:

Voltmeter Gauge (volts):

Low volts (11.8 VDC)

Amber telltale light on indicator light display with steady tone alarm

High volts (15.5 VDC)

Amber telltale light on indicator light display with steady tone alarm

Engine Tachometer (RPM)

Speedometer MPH

Fuel Level Gauge (Empty - Full in fractions):

Low fuel (1/8 full)

Amber telltale light on indicator light display with steady tone alarm

Engine Oil Pressure Gauge (PSI):

Low oil pressure to activate engine warning lights and alarms

Red telltale light on indicator light display with steady tone alarm

Front Air Pressure Gauges (PSI):

Low air pressure to activate warning lights and alarm

Red telltale light on indicator light display with steady tone alarm

Rear Air Pressure Gauges (PSI):

Low air pressure to activate warning lights and alarm

Red telltale light on indicator light display with steady tone alarm

Transmission Oil Temperature Gauge (Fahrenheit):

High transmission oil temperature activates warning lights and alarm

Amber telltale light on indicator light display with steady tone alarm

Engine Coolant Temperature Gauge (Fahrenheit):

High engine temperature activates an engine warning light and alarms

Red telltale light on indicator light display with steady tone alarm

Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):

Low fluid (1/8 full)

Amber telltale light on indicator light display

OFFICER SIDE SPEEDOMETER

Officer Speedometer, A Class I digital display speedometer should be provided on the officer side overhead position.

THERMAL IMAGING CAMERA

There should be one (1) MSA Evolution 6000 Plus Model # 10145951 thermal imaging camera with One (1) Evolution 600 vehicle kit charging bases Model # 10145771 mounted in the cab. One (1) unit should be mounted in the officer area (item listed in loose equipment). Final layout location details should be discussed at the preconstruction conference.

GAS METER

There should be one (1) Multi RAE Lite gas meter with charging base mounted in the cab on the officer side (item listed in loose equipment).There should be a power outlet provided. Final layout location details should be discussed ate preconstruction conference.

MAP BOX

There should be one (1) aluminum map box located on the open seat pedestal behind the driver seat in the crew compartment. The box will have six (6) openings, the size of the box will be approximately 20”L x 20”W and 7 .5 “H with six (6) compartments inside. Two compartments will be 12.5” x 10” and the remaining four compartments will be 5” x 7.5”. **(Item listed in loose equipment)**.

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps should be located on the instrument panel in clear view of the driver. The indicator lamps should be "dead-front" design that is only visible when active. The colored indicator lights should have descriptive text or symbols.

The following amber telltale lamps should be present:

Low coolant

Traccntl (traction control) (where applicable)

Check engine

Check trans (check transmission)

Air rest (air restriction)

Driver door open

Passenger door open

DPF (engine diesel particulate filter regeneration)

HET (engine high exhaust temperature) (where applicable)

ABS (antilock brake system)

MIL (engine emissions system malfunction indicator lamp) (where applicable)

Regen inhibit (engine emissions regeneration inhibit) (where applicable)

Trans temp (transmission temperature)

SRS (supplemental restraint system) fault (where applicable)

DEF (low diesel exhaust fluid level)

The following red telltale lamps should be present:

Ladder rack down

Parking brake

Stop engine

The following green telltale lamps should be present:

Left turn

Right turn

Battery on

Ignition

Aux brake (auxiliary brake engaged) (where applicable)

The following blue telltale lamps should be present:

High beam

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm should be provided whenever a warning message is present.

INDICATOR LAMP AND ALARM PROVE-OUT

A system should be provided which automatically tests telltale indicator lights and alarms located on the cab instrument panel. Telltale indicators and alarms should perform prove-out when the ignition switch is held in the up position for three (3) to five (5) seconds to ensure proper performance.

CONTROL SWITCHES

For ease of use, the following controls should be provided immediately adjacent to the cab instrument panel within easy reach of the driver. All switches should have backlit labels for low light applications.

Headlight/Parking light switch: A three (3)-position maintained rocker switch should be provided. The first switch position should deactivate all parking and headlights. The second switch position should activate the parking lights. The third switch should activate the headlights.

Panel backlighting intensity control switch: A variable voltage control switch should be provided. The switch moved in the up direction increases the panel backlighting intensity to a maximum and the switch moved in a down direction decreases the panel backlighting intensity to a minimum level.

Ignition switch: A three (3)-position maintained/momentary rocker switch should be provided. The first switch position should deactivate vehicle ignition. The second switch position should activate vehicle ignition. The third momentary position should perform prove-out on the telltale indicators and alarms when the ignition switch is held in the up position for three (3) to five (5) seconds to ensure proper performance. A green indicator lamp is activated with vehicle ignition.

Engine start switch: A two (2)-position momentary rocker switch should be provided. The first switch position is the default switch position. The second switch position should activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

Hazard switch should be incorporated into the steering column.

Heater and defroster controls.

Turn signal arm: A self-canceling turn signal with high beam headlight controls.

Windshield wiper control should have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control.

Chassis horn control: Activation of the chassis horn control should be provided through the center of the steering wheel.

CUSTOM SWITCH PANELS

The design of cab instrumentation should allow for emergency lighting and other switches to be placed within easy reach of the operator, thus improving

safety. There should be positions for up to three (3) switch panels in the overhead console on the driver's side, up to five (5) switch panels in the engine tunnel console, and up to three (3) switch panels in the overhead console on the officer's side. All switches have backlit labels for low light applications.

High idle engagement switch: A maintained rocker switch with integral indicator lamp should be provided. The switch should activate and deactivate the high idle function. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch should indicate when the high idle function is engaged.

"Ok To Engage High Idle" indicator lamp: A green indicator light should be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

Diesel particulate filter regeneration switch (where applicable).

Diesel particulate filter regeneration inhibit switch (where applicable).

DIAGNOSTIC PANEL

A diagnostic panel should be accessible while standing on the ground and should be located inside the driver's side door, left of the steering column. The diagnostic panel should allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches should allow engine and ABS systems to provide blink codes should a problem exist. The diagnostic panel should include the following:

Engine diagnostic port

Transmission diagnostic port

ABS diagnostic port

SRS diagnostic port (where applicable)

Engine diagnostic switch (blink codes flashed on check engine telltale indicator)

ABS diagnostic switch (blink codes flashed on ABS telltale indicator)

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light (electronic) should be provided.

CAB LOCK INDICATOR

Red indicator light on the cab dash that indicates whenever the cab locks are not fully engaged.

"DO NOT MOVE APPARATUS" INDICATOR

A red LED indicator beacon, located in the driving compartment, should be illuminated automatically per the current NFPA requirements. The light should be labeled "Do Not Move Apparatus If Light Is On".

The same circuit that activates the Do Not Move Apparatus indicator should activate a steady tone alarm when the parking brake is released.

OPEN DOOR INDICATOR LIGHT

Two (2) red indicator lights should be provided and located in clear view of the driver, warning of an open passenger or equipment compartment door.

One (1) light should indicate status of doors on the driver's side of the vehicle and the other light should indicate the status of the passenger side and rear compartment doors.

SWITCH PANELS

The built-in emergency light switch panel should have a master switch plus individual switches for selective control. The switch panel should be located in the "overhead" position above the windshield on the driver's side to allow for easy access. Switches should be rocker type with an indicator light, of which is an integral part of the switch.

WIPER CONTROL

Wiper control should consist of a two (2)-speed individual windshield wiper control with intermittent feature and windshield washer controls. The control should also have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

SPARE CIRCUIT

There should be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires should have the following features:

The positive wire should be connected directly to the battery power.

The negative wire should be connected to ground.

Wires should be protected to 15 Amps at 12 volts DC.

Power and ground should terminate officer side instrument panel for laptop computer.

Termination should be with 15 AMP, power point plug with rubber cover.

Wires should be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There should be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires should have the following features:

The positive wire should be connected directly to the battery switched power.

The negative wire should be connected to ground.

Wires should be protected to 15 Amps at 12 volts DC.

Power and ground should terminate to engine tunnel for radios.

Termination should be with heat shrinkable butt splicing.

Wires should be sized to 125% of the protection.

This circuit(s) may be load managed when the parking brake is set.

VEHICLE DATA RECORDER

A vehicle data recorder (VDR) should be provided. The VDR should be capable of reading and storing vehicle information. The VDR should be capable of operating in a voltage range from 8VDC to 16VDC. The VDR should not interfere with, suspend, or delay any communications that may exist on the CAN data link during the power up, initialization, runtime, or power down sequence. The VDR should continue operation upon termination of power or at voltages below 8VDC for a minimum of 10ms.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A CD provided with the apparatus should include the programming to download the information from the VDR. A USB cable can be used to connect the VDR to a laptop to retrieve required information.

The vehicle data recorder should be capable of recording the following data via hardwired and/or CAN inputs:

Vehicle Speed - MPH

Acceleration - MPH/sec

Deceleration - MPH/sec

Engine Speed - RPM

Engine Throttle Position - % of Full Throttle

ABS Event - On/Off

Seat Occupied Status - Yes/No by Position (7-12 Seating Capacity)

Seat Belt Buckled Status - Yes/No by Position (7-12 Seating Capacity)

Master Optical Warning Device Switch - On/Off

Time - 24 Hour Time

Date - Year/Month/Day

INTERCOM SYSTEM

A Fire-Com, Model 5100D, single radio interface intercom system should be provided. The driver should have a wireless headset charging drop and base station. Headset jacks should be located at the officer, and three (3) crew cab positions, at both forward facing seats.

The wireless base station should have a 100' to 1100' range, line of sight. Objects between the transmitter and receiver affect range.

The following components should be supplied with this system:

- One (1) 5100D Intercom unit
- One (1) Single wireless radio base station (Driver)
- Four (4) HM-10 Headset modules (Officer, 3 Crew)
- All necessary cords and wiring.

RADIO AND RADIO INTERFACE CABLE

The body builder should supply and install the required radio and radio interface cable before delivery of the vehicle. The radio equipment to be used by the customer should be Motorola XTL-5000.

HEADSET, UNDER HELMET, INTERCOM ONLY

There should be three (3) Firecom model UH-54 under helmet, intercom only headset(s) provided Crew Cab Seating Positions.

Each headset should feature:

- Coiled cord with rugged angled plug

- Noise cancelling electric microphone with wind muff

- Flex boom rotates 180 degrees for left or right dress

- Detent-volume control

- Liquid foam ear seals

- Microphone on/off button

HEADSET ONLY, WIRELESS, UNDER HELMET, RADIO TRANSMIT

There should be one (1) Firecom Model UHW-51 under helmet, wireless, radio transmit headset(s) provided. A 12-volt charging pigtail with plug should be provided Driver Position.

Each headset should feature:

- Noise cancelling electric microphone

- Flex boom rotates 180 degrees for left or right dress
- Detent-volume control
- Liquid foam ear seals
- Red Radio Push To Talk button
- Typical fire scene range is 300-500 feet
- Digital encoding for secured communications
- Rechargeable lithium ion battery, 500 cycles minimum
- Eight (8) to ten (10) hours talk time, three (3) hour charge time

HEADSET, UNDER HELMET, RADIO TRANSMIT

There should be one (1) Firecom model UH-51 under helmet, radio transmit headset(s) provided officer seat.

Each headset should feature:

- Coiled cord with rugged angled plug
- Noise cancelling electric microphone with wind muff
- Flex boom rotates 180 degrees for left or right dress
- Detent-volume control
- Liquid foam ear seals
- Radio Push to Talk button. Mic is always live for intercom communication

HEADSET HANGERS

There should be five (5) headset hanger/s installed for the intercom system. The hanger/s should be installed each seating position.

RADIO ANTENNA MOUNT

An antenna-mounting base, Model MATM, with 17 feet of coax cable and weatherproof cap should be provided for a two (2)-way radio.

The mount should be located on the cab roof just to the rear of the officer seat.

The cable should be routed to the seat box on the officer side with enough cable for customer to route to the instrument panel if needed.

Note: There will be one (1) radio antenna mount.

CELL/PCS/LTE/WI-FI ANTENNA

There should be one (1) AP-Cell/PCS/LTE/Wi-Fi Antenna. Threaded Bolt Mount in large teardrop housing.15 feet RG-58U coax with TNC connector on Wi- Fi Color Black. Part number AP-CW-Q-S11-BL

ELECTRICAL POWER CONTROL SYSTEM

A compartment should be provided in or under the cab to house the vehicle's electrical power and signal circuit protection and control components. The power and signal protection and control compartment should contain circuit protection devices and power control devices. Power and signal protection and control components should be protected against corrosion, excessive heat, excessive vibration, physical damage and water spray.

Serviceable components should be readily accessible.

Circuit protection devices, which conform to SAE standard, should be utilized to protect each circuit. All circuit protection devices should be sized to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers should be Type-I automatic reset (continuously resetting) and conform to SAE J553 or J258. PTO power circuits should be protected by Type III manual reset non-cycling circuit breakers conforming to SAE J553 or J258 which remain open until manually reset. When required, automotive type fuses conforming to SAE J554, J1284, J1888 or J2077 should be utilized to protect electronic equipment.

Power control relays and solenoids should have a direct current (dc) rating of 125 percent of the maximum current for which the circuit is protected.

Visual status indicators should be supplied to identify control safety interlocks and vehicle status. In addition to visual status indicators, audible alarms designed to provide early warning of problems before they become critical should be used.

VOLTAGE MONITOR SYSTEM

A voltage monitor system should be provided to indicate the status of each battery system connected to the vehicles electrical load. The monitor system should provide visual and audio warning when the system voltage is above or below optimum levels.

POWER AND GROUND STUDS

A 12-volt power stud and a grounding stud should be provided in the electrical component compartment for two-way radio equipment.

EMI/RFI PROTECTION

The electrical system proposed should include means to control undesired electromagnetic and radio frequency emissions. State of the art electrical system design and components should be used to ensure radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions are suppressed at their source.

The apparatus proposed should have the ability to operate in the electromagnetic environment typically found in fire ground operations. The Contractor should be able to demonstrate the EMI and RFI testing has been done on similar apparatus and certifies that the vehicle proposed meets SAE J551 requirements.

EMI/RFI susceptibility should be controlled by applying immune circuit designs, shielding, twisted pair wiring and filtering. The electrical system should be designed for full compatibility with low level control signals and high powered two-way radio communication systems. Harness and cable routing should be given careful attention to minimize the potential for conducting and radiated EMI-RFI susceptibility.

ELECTRICAL HARNESSING INSTALLATION

To ensure rugged dependability, all 12-volt wiring harnesses installed by the apparatus Manufacturer should conform to the following specifications:

SAE J1128 - Low tension primary cable

SAE J1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring

SAE J163 - Low tension wiring and cable terminals and splice clips

SAE J2202 - Heavy duty wiring systems for on-highway trucks

NFPA 1901 - Standard for automotive fire apparatus

FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses

SAE J1939 - Serial communications protocol

SAE J2030 - Heavy-duty electrical connector performance standard

SAE J2223 - Connections for on board vehicle electrical wiring harnesses

NEC - National Electrical Code

SAE J561 - Electrical terminals - Eyelet and spade type

SAE J928 - Electrical terminals - Pin and receptacle type A

Wiring should be run in loom where exposed, and have grommets or other edge protection where wires pass through metal. Automatic reset circuit breakers should be provided which conform to SAE standards. Wiring should be color, function and number coded. Wire colors should be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires and uses a single wire color for all wires should not be allowed. Function and number codes should be continuously imprinted on all wiring harness conductors at 2.00" intervals. All wiring installed between the cab and into doors should be enclosed within an expandable rubber boot to protect the wiring. Exterior exposed wire connectors should be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment should be installed utilizing the following guidelines:

1. All wire ends not placed into connectors should be sealed with a heat shrink end cap. Wires without a terminating connector or sealed end

cap should not be allowed. All holes made in the roof should be caulked with silicon. Large fender washers, liberally caulked, should be used when fastening equipment to the underside of the cab roof. Any electrical component that is installed in an exposed area should be mounted in a manner that should not allow moisture to accumulate in it. Exposed area should be defined as any location outside of the cab or body. For low cost of ownership, electrical components designed to be removed for maintenance should be quickly accessible. For ease of use, a coil of wire should be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work. Corrosion preventative compound should be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections should require this compound in the plug to prevent corrosion and for easy separation of the plug. Any lights containing non-waterproof sockets in a weather-exposed area should have corrosion preventative compound added to the socket terminal area. All electrical terminals in exposed areas should have DOW 1890 protective Coating applied completely over the metal portion of the terminal. Rubber coated metal clamps should be used to support wire harnessing and battery cables routed along the chassis frame rails. Heat shields should be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust should be protected by a heat shield.

All braided wire harnesses should have a permanent label attached for easy identification of the harness part number and fabrication date.

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus Manufacturer should conform to the following requirements:

SAE J1127 - Battery Cable

SAE J561 - Electrical terminals, eyelets and spade type

SAE J562 - Nonmetallic loom

SAE J836A - Automotive metallurgical joining

SAE J1292 - Automotive truck, truck-tractor, trailer and motor coach wiring

NFPA 1901 - Standard for automotive fire apparatus

Battery cables and battery cable harnessing should be installed utilizing the following guidelines:

1. All battery cables and battery harnesses should have a permanent label attached for easy identification of the harness part number and fabrication date. Splices should not be allowed on battery cables or battery cable harnesses. For ease of identification and simplified use,

battery cables should be color coded. All positive battery cables should be red in color or wrapped in red loom the entire length of the cable. All negative battery cables should be black in color. For ease of identification, all positive battery cable isolated studs throughout the cab and chassis should be red in color.

For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus should be coated to prevent corrosion.

ELECTRICAL COMPONENT INSTALLATION

All lighting used on the apparatus should be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. Lights using an apparatus metal structure for grounding should not be allowed. All lights and reflectors, required to comply with Federal Vehicle Safety Standard #108, should be furnished. Rear identification lights should be recessed mounted for protection. Lights and wiring mounted in rear bulkheads should be protected from damage by installing a false bulkhead inside the rear compartments.
An operational test should be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests should be recorded and provided to the purchaser at time of delivery.

CAB SWITCHING INSTALLATION

All emergency light switches should be mounted on a separate panel installed in the cab. A master warning light switch and individual switches should be provided to allow pre-selection of emergency lights. The light switches should be rocker type with an internal indicator light to show when switch is energized. All switches should be properly identified and mounted in a removable panel for ease in servicing. Identification of the switches should be done by either printing or etching on the switch panel. The switches and identification should be illuminated.

BATTERY SYSTEM

Five (5) 12 volt, batteries that include the following features should be provided:

- 950 CCA (cold cranking Amps)

- 170 reserve capacity

- High cycle

- Maintenance free

- Group 31

- Rating of 4750 CCA at 0 degrees Fahrenheit

- 1020 minutes of reserve capacity

- Threaded posts

BATTERY SYSTEM

A single starting system should be provided.

An ignition switch and starter button should be located on the instrument panel.

MASTER BATTERY SWITCH

A master battery switch, to activate the battery system, should be provided inside the cab within easy reach of the driver.

An indicator light should be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

Batteries should be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments should be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The battery hold-downs should be of a non-corrosive material. All bolts and nuts should be stainless steel.

Heavy-duty battery cables should be used to provide maximum power to the electrical system. Cables should be color-coded.

Battery terminal connections should be coated with anti-corrosion compound. Battery solenoid terminal connections should be encapsulated with semi-permanent rubberized compound.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers should be installed on the bottom of the driver's side battery box. This should provide for easy jumper cable access.

BATTERY CHARGER

A Kussmaul Autocharge 12 HO, 091-170-12 battery charger should be provided. A display bar graph, indicating the state of charge, should be provided.

The charger should have a maximum output of 20 Amps and a fully automatic regulation.

The battery charger should be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.

Battery charger should be located in the crew cab seat riser.

The battery charger indicator should be located behind the driver's door on the outside of the cab.

AUTO EJECT SHORELINE
There should be one (1) shoreline receptacle provided to operate the 120-volt circuits on the truck without the use of the generator.

The shoreline receptacle (s) should be provided with a NEMA 5-20, 120 volt, 20 AMP, straight blade plug and red cover.

The shoreline should be connected to Kussmaul.

A mating connector body should also be supplied with the loose equipment.

The shoreline receptacle should be located on the driver side of cab, above wheel.

STAINLESS STEEL BATTERY TRAYS
Stainless steel battery trays should be provided for the batteries to sit in.

ALTERNATOR
A Leece-Neville, model 4890JB or Delco Remy®, model 55SI alternator should be provided. It should have a rated output current of 320 Amps, as measured by SAE method J56. The alternator should feature an integral, self-diagnostic regulator and rectifier. The alternator should be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

ELECTRONIC LOAD MANAGEMENT
A Kussmaul electronic load management (ELM) system should be provided that monitors the vehicles 12-volt electrical system, and automatically reduces the electrical load in the event of a low voltage condition and by doing so, ensures the integrity of the electrical system.

The ELM should monitor the vehicle's voltage while at the scene (parking brake applied). It should sequentially shut down individual electrical loads when the system voltage drops below a preset value. Five (5) separate electrical loads should be controlled by the load manager. The ELM should sequentially re-energize electrical loads as the system voltage recovers.

The (ELM) also includes sequencer function for the five (5) managed loads and two (2) additional.

EXTERIOR LIGHTING
Exterior lighting should meet or exceed Federal Department of Transportation, Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at time of proposal.

Front headlights should be halogen, rectangular shape, one (1) pair mounted in each front trim housing.

The LED directional lights should wrap-around on the outside corners of the trim housing. The headlight and LED directional lights should be in the same assembly.

Five (5) LED clearance and marker lights should be installed across the leading edge of the cab.

REAR ID/MARKER DOT LIGHTING

There should be one (1) Truck-Lite Model 15050R three (3) LED light kit used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical Centerline.
- Centers spaced not less than six (6) inches or more than twelve (12) inches apart.
- Red in color.
- All at the same height.

There should be two (2) Ri-Tar LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle.
- One (1) each side of the vertical centerline.
- As near the top as practical.
- Red in color.
- To be visible from the rear.

There should be two (2) Ri-Tar LED lights installed on the side of the apparatus as close to the rear as practical per the following:

- To indicate the overall length of the vehicle.
- One (1) each side of the vertical centerline.
- As near the top as practical.
- Red in color.
- To be visible from the side.

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

The rear stop/tail and directional lighting should consist of the following:

Two (2) Whelen, Model 60R00BRR, red LED stop/tail lights.

Two (2) Whelen, Model 60A00TAR, amber LED populated arrow turn lights.

These lights should be installed at the rear of the truck in a polished housing.

Four (4) red reflectors should be provided.

A license plate bracket should be mounted at the rear in a highly visible location where it does not interfere with other equipment. An LED light should illuminate the license plate.

Two (2) Whelen, Model: 60J000CU backup lights should be provided.

LIGHTING BEZEL
Two (2) Whelen, model CAST4V, four (4) light aluminum housings should be provided for mounting four (4) Whelen 600 lights.

BACK-UP ALARM
A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse should be provided. The device should sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

WARNING LIGHT CONNECTIONS
All of the warning lights should include Deutsch, Model: DT two (2) position connectors.

LIGHT, INTERMEDIATE
There should be one (1) pair, of Truck-Lite, Model: 60115Y, amber, LED, turn signal, marker lights furnished, one (1) each side, horizontally in the rear fender panel.

A stainless steel trim should be included with this installation.

PERIMETER SCENE LIGHTS, CAB
There should be a Truck-Lite, model 60, grommet mount weatherproof light provided for each cab door. Lighting should be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits, which should be activated automatically when the exit doors are opened and by the same means as the body perimeter lights.

The lighting should be capable of providing illumination at a minimum level of two (2) foot-candles on ground areas within 30.00" of the edge of the apparatus in areas which personnel climb in or out of the apparatus or descend from the apparatus to the ground level.

PERIMETER SCENE LIGHTS, BODY
There should be a total of four (4) Truck-Lite, model 60, grommet mount, weatherproof lights provided on the apparatus. Two (2) lights should be provided under the rear step area and two (2) lights should be provided under the pump panel running boards. The lights should be spaced one (1) each side of apparatus and have a clear lens. The perimeter scene lights should be activated by a switch in the cab.

The lighting should be capable of providing illumination at a minimum level of two (2) foot-candles on ground areas within 30.00" of the edge of the apparatus

in areas designed for personnel to climb onto the apparatus or descend from the apparatus to the ground level.

STEP LIGHTS

Four (4) Ri-Tar, Model M27HW2 Super LED, step lights should be provided. One (1) step light should be provided on each side, on the front compartment face and two (2) step lights at the rear to illuminate the tailboard.

These step lights should be actuated with the pump panel light switch.

All other steps on the apparatus should be illuminated per the current edition of NFPA 1901.

SCENE LIGHTS

There should be two (2) Whelen, Model 60C0ELZR Gradient LED scene light(s) with chrome flange installed at the rear of the apparatus, one (1) each side rear body bulkhead upper.

A control for the light(s) selected above should be the following:

A switch at the driver's side switch panel.

These lights may be load managed when the parking brake is set.

12 VOLT LIGHTING

There will be one (1) Whelen Pioneer PCP2 ,black light head (12 volt) LED combination spotlight and floodlight(s) provided on the front visor, centered.

The light(s) will be controlled by a switch at the driver's side switch panel

These lights may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There will be two (1) Whelen PCP2 Pioneer LED (12 volt) combination spot/floodlights(s) provided on a Fire Research, Model LTP530-NOW-HT100, side mount, push up pole with top wire. The LED flood light will use a Havis Shield KR-PLA adapter bracket with a switch to mount each light. (Note: in the mounted position light heads should not be above cab or passed side of body).

The lights will be located PS back of cab.

The light(s) will be controlled by a switch at the pump operator's panel and passenger side pump panel.

These light(s) may be load managed when the parking brake is applied.

These lights will not be connected to the Do Not Move Truck Indicator circuit

12 VOLT LIGHTING

There will be two (1) Whelen PCP2 Pioneer LED (12 volt) combination spot/floodlights(s) provided on a Fire Research, Model LTP530-NOW-HT100, side mount, push up pole with top wire. The LED flood light will use a Havis

Shield KR-PLA adapter bracket with a switch to mount each light. (Note: in the mounted position light heads should not be above cab or passed side of body).

The lights will be located DS back of cab.

The light(s) will be controlled by a switch at the pump operator's panel and passenger side pump panel.

These light(s) may be load managed when the parking brake is applied.

These lights will not be connected to the Do Not Move Truck Indicator circuit

DECK LIGHTS

One (1)-6.00" Unity AG deck lights with swivel mount should be provided at the rear of the hose bed, driver side.

One (1) light should be furnished with a 160,000 candle power halogen spot bulb.

WATER TANK

Booster tank should have a capacity of 750 gallons and be constructed of polypropylene plastic by United Plastic Fabricating, Incorporated.

Tank joints and seams should be nitrogen welded inside and out.

Tank should be baffled in accordance with NFPA Bulletin 1901 requirements.

Baffles should have vent openings at both the top and bottom to permit movement of air and water between compartments.

Longitudinal partitions should be constructed of .38" polypropylene plastic and should extend from the bottom of the tank through the top cover to allow for positive welding.

Transverse partitions should extend from 4.00" off the bottom of the tank to the underside of the top cover.

All partitions should interlock and should be welded to the tank bottom and sides.

Tank top should be constructed of .50" polypropylene. It should be recessed .38" and should be welded to the tank sides and the longitudinal partitions.

Tank top should be sufficiently supported to keep it rigid during fast filling conditions.

Construction should include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels should be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump that is 8.00" long x 8.00" wide x 6.00" deep should be provided at the bottom of the water tank.

Sump should include a drain plug and the tank outlet.

Tank should be installed in a fabricated cradle assembly constructed of structural steel.

Sufficient crossmembers should be provided to properly support bottom of tank. Crossmembers should be constructed of steel bar channel or rectangular tubing.

Tank should "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, should be placed on all horizontal surfaces that the tank rests on.

Stops or other provision should be provided to prevent an empty tank from bouncing excessively while moving vehicle.

Mounting system should be approved by the tank Manufacturer.

Fill tower should be constructed of .50" polypropylene and should be a minimum of 8.00" wide x 14.00" long.

Fill tower should be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, should be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

An auxiliary vent should be provided inside the tank to release trapped air when fill the tank while the truck is on an incline. A 1.00" PVC tube should be routed internally from the rear of the tank to the fill tower.

Rubber cushions, .13 x 3.00", should be provided on all vertical corner surfaces of the water tank cradle where tank contact could occur.

The water tank fill dome should be located move fill dome to left side leaving space between tank dome and side sheet for a single stack of 2.50" hose.

Two (2) sleeves should be provided in the water tank for plumbing to the rear.

HOSE BED

The hose body should be fabricated of 12-gauge galvanneal steel.

The sides should not form any portion of the fender compartments.

Hose body width should be minimum of 68.00" inside.

Upper and rear edges of side panels should have a double break for rigidity, a split tube finish should not be acceptable.

The upper inside area of the beavertails should be covered with brushed stainless steel to prevent damage to painted surface when hose is removed.

Flooring of the hose bed should be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats should be a minimum of .50" x 4.50" with spacing between slats for hose ventilation.

Hose bed should accommodate 300' of 2.50"/1400' of 5.00"/950' of 2.50".

Two (2) adjustable hose bed dividers should be furnished for separating hose.

Each divider should be constructed of a .125" brushed aluminum sheet fitted and welded into a slotted, radiused extrusion along the top, bottom and rear edge.

The foot of the divider should be furnished with an aggressive surface to prevent sliding.

Divider should be held in place by tightening two (2) bolts, one (1) at each end.

Acorn nuts should be installed on all bolts in the hose bed which have exposed threads.

HOSEBED HOSE RESTRAINT

A red hose bed cover should be furnished with Velcro with snaps fasteners at the front and Velcro fasteners on the sides. There should be shock cord retentions at the rear for hose bed cover. There should be hooks at the bottom of the rear body sheet below the hose bed. The flap at the rear should be weighted with lead shot.

RUNNING BOARDS

Running boards should be fabricated of .125" bright aluminum tread plate.

Each running board should be supported by a welded 2.00" square tubing and channel assembly, which should be bolted to the pump compartment substructure.

Running boards should be 12.75" deep and spaced .50" away from the pump panel.

A splashguard should be provided above the running board tread plate.

TAILBOARD

Rear step should also be constructed of .125" bright aluminum tread plate and spaced .50" from the body, as well as supported by a structural steel assembly.

The rear tailboard should be 16.00" deep.

The exterior side should be flanged down and in.

Flanges should not be notched.

Entire rear surface between the beavertails should be covered with smooth aluminum.

Inside surface of each beavertail in the hose bed area should be covered with stainless steel to protect the paint finish.

The remaining inside surface of the beavertails should be covered with bright aluminum tread plate.

TOW BAR

A tow bar should be installed under the tailboard at center of truck.

Tow bar assembly should be constructed of .38" structural angle. When force is applied to the bar, it should be transmitted to the frame rail.

Tow bar assembly should be designed and positioned to allow up to a 30-degree upward angled pull of 17,000 lb., or a 20,000 lb. straight horizontal pull in line with the centerline of the vehicle.

Tow bar design should have been fully tested and evaluated using strain gauge testing and finite element analysis techniques.

COMPARTMENTATION

Body and compartments should be fabricated of galvanneal steel or a comparable material.

Side compartments should be an integral assembly with the rear fenders.

Circular fender liners should be provided for prevention of rust pockets and ease of maintenance.

Compartment flooring should be 12-gauge and of the sweep out design, with the floor higher than the compartment door lip.

The compartment door opening should be framed by flanging the edges in 1.75” and bending out again .75” to form an angle.

Drip protection should be provided above the doors by means of bright aluminum extrusion, formed bright aluminum tread plate, or polished stainless steel.

The top of the compartment should be covered with bright aluminum tread plate rolled over the edges on the front, rear, and outward side. These covers should have the corners TIG welded.

Side compartment covers should be separate from the compartment tops.

Front facing compartment walls should be covered with bright aluminum tread plate.

All screws and bolts which protrude into a compartment should have acorn nuts on the ends to prevent injury.

UNDER COATING BODY AND PUMP SUBSTRUCTURE

The body substructures should be treated with an under coating material to provide resistance to corrosion and chemicals.

AGGRESSIVE WALKING SURFACE
All exterior surfaces designated as stepping, standing, and walking areas should comply with the required average slip resistance of the current NFPA standards.

LOUVERS
Louvers should be stamped into compartment walls to provide the proper airflow inside the body compartments and to prevent water from dripping into the compartment. Where these louvers are provided, they should be formed into the metal and not added to the compartment as a separate plate.

TESTING OF BODY DESIGN
Body structural analysis should be fully tested. Proven engineering and test techniques such as finite element analysis, model analysis, stress coating and strain gauging should be performed with special attention given to fatigue, life and structural integrity of the cab, body and substructure.

The body should be tested while loaded to its greatest in-service weight.

Actual testing techniques should be made available upon request.

COMPARTMENTATION, DRIVER'S SIDE
A full height, roll-up door compartment ahead of the rear wheels should be provided. The interior dimensions of this compartment should be 34.50" wide x 58.25" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment should be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment should be calculated with the compartment door closed. The compartment interior should be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment should be 28.75" wide x 58.25" high.

Closing of the door should not require releasing, unlocking, or unlatching any mechanism and should easily be accomplished with one hand.

A roll-up door compartment over the rear wheels should be provided. The interior dimensions of this compartment should be 66.50" wide x 25.38" high x 12.00" deep. The height of the compartment should be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment should be calculated with the compartment door closed. The clear door opening of this compartment should be 58.25" wide x 25.12" high.

Closing of the door should not require releasing, unlocking, or unlatching any mechanism and should easily be accomplished with one hand.

A full height, roll-up door compartment behind the rear wheels should be provided. The interior dimensions of this compartment should be 47.50" wide x 58.25" high x 25.88" deep in the lower 26.00" of height and 12.00" deep in the remaining upper section of the compartment. The height of the compartment

should be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment should be calculated with the compartment door closed. The compartment interior should be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment should be 44.75" wide x 58.25" high.

Closing of the door should not require releasing, unlocking, or unlatching any mechanism and should easily be accomplished with one hand.

COMPARTMENTATION, PASSENGER'S SIDE

A full height, roll-up door compartment ahead of the rear wheels should be provided. The interior dimensions of this compartment should be 34.50" wide x 58.25" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment should be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment should be calculated with the compartment door closed. The compartment interior should be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment should be 28.75" wide x 58.25" high. Closing of the door should not require releasing, unlocking, or unlatching any mechanism and should easily be accomplished with one hand.

A roll-up door compartment over the rear wheels should be provided. The interior dimensions of this compartment should be 66.50" wide x 25.38" high x 12.00" deep. The height of the compartment should be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment should be calculated with the compartment door closed. The clear door opening of this compartment should be 58.25" wide x 25.12" high. Closing of the door should not require releasing, unlocking, or unlatching any mechanism and should easily be accomplished with one hand.

A full height, roll-up door compartment behind the rear wheels should be provided. The interior dimensions of this compartment should be 47.50" wide x 58.25" high x 12.00" deep. A section of this compartment should be 25.88" deep x 47.50" wide x 26.00" high directly behind the rear wheels. The height of the compartment should be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment should be calculated with the compartment door closed. The compartment interior should be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment should be 44.75" wide x 58.25" high. Closing of the door should not require releasing, unlocking, or unlatching any mechanism and should easily be accomplished with one hand.

ROLL-UP DOOR, SIDE COMPARTMENTS

There should be six (6) compartment doors installed on the side compartments. The doors should be double faced aluminum construction, painted one (1) color to match the lower portion of the body. Lath sections should be an interlocking rib design and should be individually replaceable without complete disassembly of door.

Between each slat at the pivoting joint should be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals should allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals should be provided to resist ingress of dirt and weather and be made of Santoprene.

All hinges, barrel clips and end pieces should be nylon 66. All nylon components should withstand temperatures from plus 300 to minus 40 degrees Fahrenheit. Hardened plastic should not be acceptable.

A polished stainless steel lift bar to be provided for each roll-up door. Lift bar should be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge should be supplied over lift bar for additional area to aid in closing the door.

Doors should be constructed from an aluminum box section. The exterior surface of each slat should be flat. The interior surfaces should be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartments, the spring roller assembly should not exceed 3.00" in diameter. A garage style roll door should not be acceptable.

The header for the roll-up door assembly should not exceed 4.00".

A heavy-duty magnetic switch should be used for control of open compartment door warning lights.

COMPARTMENTATION, REAR

A roll-up door compartment above the rear tailboard should be provided.

Interior dimensions of this compartment should be 40.00" wide x 47.38" high x 25.88" deep in the lower 38.75" of height and 15.75" deep in the remaining upper portion. Depth of the compartment should be calculated with the compartment door closed.

A louvered, removable access panel should be furnished on the back wall of the compartment.

Rear compartment should be open into the rear side compartments.

Clear door opening of this compartment should be 33.25" wide x 38.75" high.

Closing of the door should not require releasing, unlocking, or unlatching any mechanism and should easily be accomplished with one hand.

PULL-OUT TRAY REAR COMPARTMENT

There should be one (1) slide-out tray, with 2" sides, and a capacity of 500 pounds provided. Capacity rating should be in the extended position.

Slides should be General Device ball bearing type, for ease of operation and years of dependable service.

Automatic locks should be provided for both the "in" and "out" positions. The trip mechanism for it should be located at the front of the tray for ease of use with a gloved hand. It should be designed to carry the following Hurst tool equipment ML-28 defended spreader, MOC-Ultra cutters, T-41 telescoping ram, T-59 telescoping ram, mini cutter, a 66' of hose, (2) 33'of hose. Final dimensions, layout, and further construction details should be discussed at the preconstruction conference.

ROLL-UP DOOR, REAR COMPARTMENT

There should be a rear roll up door. The door should be double-faced aluminum construction, an anodized satin finish. Lath sections should be an interlocking rib design and should be individually replaceable without complete disassembly of door.

Between each slat at the pivoting joint should be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals should allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals should be provided to resist ingress of dirt and weather and be made of Santoprene.

All hinges, barrel clips and end pieces should be nylon 66. All nylon components should withstand temperatures from plus 300 to minus 40 degrees Fahrenheit. Hardened plastic should not be acceptable.

A polished stainless steel lift bar to be provided for each roll-up door. Lift bar should be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge should be supplied over lift bar for additional area to aid in closing the door.

Door should be constructed from an aluminum box section. The exterior surface of each slat should be flat. The interior surface should be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartments, the spring roller assembly should not exceed 3.00" in diameter. A garage style roll door should not be acceptable.

The header for the roll-up door assembly should not exceed 4.00".

A heavy-duty magnetic switch should be used for control of open compartment door warning lights.

DOOR GUARD

There should be seven (7) compartment doors that should include a guard/drip pan designed to protect the roll-up door from damage when in the retracted position and contain any water spray. The guard should be fabricated from stainless steel and installed each roll-up door compartment.

COMPARTMENT LIGHTING

LED strip lights should be provided on each side (right and left) in each enclosed compartment.

Opening the compartment door should automatically turn compartment lighting on.

MOUNTING TRACKS

There should be four (4) sets of tracks for mounting shelf(s) in each shelf supplied compartment. These tracks should be installed vertically to support the adjustable shelf(s), and should be full height of the compartment. The tracks should be painted to match the compartment interior.

HIGH RISE HOSE HOOKS

There should be three (3) high-rise hooks located in the rear right compartment (right side) upper position. Each hook should be capable of holding one (1) section of 2.5” hose. The hooks should be evenly spaced apart.

ADJUSTABLE SHELVES

There should be six (6) shelves with a capacity of 500 pounds provided. The shelf construction should consist of .188" aluminum with 2.00" sides. Each shelf should be painted to match the compartment interior. Each shelf should be infinitely adjustable by means of a threaded fastener, which slides in a track.

The shelves should be held in place by .12" thick stamped plated brackets and bolts.

The location should be one (1) in upper and lower portion of driver and passenger side front compartment, one (1) in passenger side over wheel compartment and one (1) in tailboard compartment.

PULL-OUT TRAY DRIVER SIDE REAR

There should be one (1) slide-out tray, with 2” sides, size should be 20” length across the front 22.5 in depth and a capacity of 500 pounds provided. Capacity rating should be in the extended position.

Slides should be General Device ball bearing type, for ease of operation and years of dependable service.

Automatic locks should be provided for both the "in" and "out" positions. The trip mechanism for it should be located at the front of the tray for ease of use with a gloved hand.

Tray should be located in driver side rear compartment forward of partition. It should be designed to carry the following Hurst tool equipment 4 cycle simo power unit.

Heavy-duty steel angle iron assembly should support the body under the compartment floor. It should be attached to the chassis frame for load transfer and to reduce stress on body.

PARTITION, VERTICAL COMPARTMENT

One (1) partition should be bolted in driver side rear compartment approximately 16" from rear wall (to allow approx. a 15" clear opening). Each partition should be the full vertical height of the compartment.

PERMANENTLY MOUNTED SHELF

A permanently mounted compartment shelf should be provided. A total of one (1) should be installed driver side rear compartment forward of partition mounted in upper area where bottom of tray is at the same level of blister.

RUB RAIL

Bottom edge of the side compartments should be trimmed with a bright aluminum extruded rub rail.

Trim should be 2.12" high with 1.38" flanges turned outward for rigidity.

The rub rails should not be an integral part of the body construction, which allows replacement in the event of damage.

BODY FENDER CROWNS

Stainless steel fender crowns should be provided around the rear wheel openings.

A rubber welting should be provided between the body and the crown to seal the seam and restrict moisture from entering.

A dielectric barrier should be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

HOSE TROUGHS

Hard suction hose should be carried in two (2) V-shaped troughs, one (1) each side, and held in place by chrome plated, quarter turn, spring loaded clamps.

Troughs should be constructed of steel and painted job color. The hard suction troughs should be inboard and as low as possible.

HANDRAILS

The handrails should be 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface.

Chrome plated end stanchions should support the handrail. Plastic gaskets should be used between end stanchions and any painted surfaces.

Drain holes should be provided in the bottom of all vertically mounted handrails.

- Four (4) handrails should be provided, two above each side pump panel.

- One (1) vertical handrail should be provided on the driver's side body, on the front bulkhead door frame.

- One (1) vertical handrail, not less than 29.00" long, should be located on each rear beavertail.

- One (1) full width horizontal handrail should be provided below the hose bed at the rear of the apparatus.

SCBA CYLINDER STORAGE (Single Cylinder)

A total of one (1) SCBA cylinder compartment should be provided and located one (1) passenger side rear of body wheel well. The SCBA cylinder compartment should be in the form of a round tube (7.63" diameter minimum) and of adequate depth to accommodate different size SCBA cylinders. Flooring should be rubber lined and have a drain hole. A stainless steel door with a chrome-plated latch should be provided to contain the SCBA cylinder. A dielectric barrier should be provided between the door hinge, hinge fasteners and the body sheet metal.

SCBA CYLINDER STORAGE (Double Bottle)

A total of two (2) SCBA cylinder compartments should be provided. One (1) each side forward of body wheel well. Each SCBA cylinder compartment should be of adequate size to accommodate two (2) SCBA cylinders. Flooring should be rubber lined and be furnished with a drain hole. A stainless steel door with a chrome plated latch should be provided to contain the SCBA cylinders. A dielectric barrier should be provided between the door hinge, hinge fasteners and the body sheet metal.

LADDER/BACKBOARD STORAGE

The ladders and backboards should be stored between the water tank and the passenger's side compartments.

The ladders should extend into the pump compartment just to the rear of the water pump discharges.

The ladder/backboard storage area should be enclosed as practical by means of sheet metal to protect the ladders from road dirt. The ladders that extend into the pump house should also be enclosed. A black rubber boot should be provided to enclosed the ladders in the gap between the pump house and the body.

Each ladder and backboard should be stored vertically in a separate stainless steel storage trough. Each stainless steel trough should be lined with a nylon type scuff plate.

A bright aluminum tread plate enclosure should be provided at the rear of the body to properly contain the ladders and backboards. This enclosure should extend to the rear of the side body compartments.

The enclosure should also include a vertically hinged smooth aluminum door with a D-handle latch to access the ladders.

EXTENSION LADDER

There should be a 24', two (2) section, Alco-Lite, Series PEL-24 extension ladder provided.

ROOF LADDER

There should be a 14’ aluminum, Alco-Lite, Series PRL-14 roof ladder provided.

FOLDING LADDER

One (1) 10' aluminum, Series FL-10 folding ladder should be installed in a U-shaped trough inside the ladder storage compartment.

PIKE POLE STORAGE

Aluminum tubing should be used for the storage of two (2) pike pole and should be located ladder storage compartment. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuff plate should be provided.

BACKBOARD STORAGE

There should be a stainless steel trough within the ladder/backboard storage compartment to house one (1) backboard. The compartment should be designed for a 7”x15.75”W x 2” H backboard.

REAR FOLDING STEPS

Bright finished, non-skid folding steps with a luminescent coating that is rechargeable from any light source and can hold a charge for up to 24 hours should be provided at the rear. The steps can be used as a hand hold with two openings wide enough for a gloved hand.

Three (3) additional folding steps should be located on the driver's side exterior front of body. The step(s) should be bright finished, non-skid with a luminescent coating that is rechargeable from any light source and can hold a charge for up to 24 hours. The step(s) can be used as a hand hold with two openings wide enough for a gloved hand.

Three (3) additional folding steps should be located on the passenger side, exterior front of body. The step(s) should be bright finished, non-skid with a luminescent coating that is rechargeable from any light source and can hold a charge for up to 24 hours. The step(s) can be used as a hand hold with two openings wide enough for a gloved hand.

MIDSHIP FIRE PUMP

Midship fire pump should be a Hale QMAX-150, 1500 gpm single (1) stage midship mounted centrifugal type.

Pump should be the class "A" type.

Pump should deliver the percentage of rated discharges at the pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure.
- 100% of rated capacity at 165 psi net pump pressure.
- 70% of rated capacity at 200 psi net pump pressure.
- 50% of rated capacity at 250 psi net pump pressure.

Entire pump and both suction and discharge passages should be hydrostatically tested to a pressure of 500 psi.

Pump should be fully tested at the pump Manufacturer's factory to the performance requirements as outlined by the current NFPA 1901 standards and should be free from objectionable pulsation and vibration.

Pump body and related parts should be of fine grain, alloy cast iron with a minimum tensile strength of 30,000 psi (2041.2 bar).

All moving parts in contact with water should be of high quality bronze or stainless steel. Pumps utilizing castings made of lower tensile strength cast iron should not be acceptable.

Pump body should be horizontally split, on a single plane in two (2) sections, for easy removal of entire impeller assembly, including wear rings and bearings from beneath the pump, without disturbing pump piping or the mounting of the pump in the chassis.

Pump should have one (1) double suction impeller. The pump body should have two (2) opposed discharge volute cutwaters to eliminate radial unbalance.

Pump impeller should be hard, fine grain bronze of the mixed flow design, accurately machined, hand-ground, and individually balanced. The vanes of the impeller intake eyes should be hand-ground and polished to a sharp edge. They should be of sufficient size and design to provide ample reserve capacity utilizing minimum horsepower.

Impeller clearance rings should be bronze and easily renewable without replacing impeller or pump volute body. They should be of the wrap-around double labyrinth design for maximum efficiency.

Pump shaft should be electric furnace heat-treated, corrosion resistant stainless steel. It should be super-finished under packing with galvanic corrosion (zinc separators in packing) protection for longer shaft life. Pump shaft should be sealed with double oil seal to keep road dirt and water out of drive unit.

Pump shaft should be rigidly supported by three (3) bearings for minimum deflection. A high lead bronze sleeve bearing should be located immediately adjacent to the impeller (on the side opposite of the drive unit). The sleeve bearing should be automatically oil lubricated and pressure balanced to exclude foreign material. The remaining bearings should be heavy-duty, deep groove ball bearings in the gearbox and should be splash lubricated.

Pump shaft should have one (1) packing gland located on inlet side of the pump, and should be of the split design for ease of repacking.

Packing gland should be a full-circle threaded design to exert uniform pressure on packing and prevent "cocking" and uneven packing load when it is tightened. (**No Exception**)

The packing gland should be easily adjusted by hand (with a rod or screwdriver), no special tools or wrenches required.

Packing rings should be of a unique, permanently lubricated, long-life graphite composition, and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion.

PUMP TRANSMISSION

The drive unit should be cast and completely manufactured and tested at the pump Manufacturer's factory. The pump drive unit should be of sufficient size to withstand up to 16,000 foot/pound of torque from the engine in both road and pump operating conditions. The drive unit should be designed with ample lubrication reserve to maintain the proper operating temperature.

The gearbox drive shafts should be of heat treated chrome nickel steel and at least 2.75 inches in diameter, on both the input and output drive shafts. They should be designed to withstand the full torque of the engine in both road and pump operating conditions. All gears, both drive and pump, should be of the highest quality, electric furnace, chrome nickel steel. Bores should be ground to size and teeth integrated, crown-shaved and hardened, to give an extremely accurate gear for long life, smooth, quiet running and higher load carrying capability. An accurately cut spur design should be provided to eliminate all possible end thrust.

The pump ratio should be selected by the apparatus Manufacturer to provide the maximum performance with the engine and transmission selected. Three (3) green warning lights should be provided to indicate to the operator(s) when the pump has completed the shift from Road to Pump position. Two (2) lights should be located in the truck driving compartment and one (1) light on pump operator's panel, adjacent to the throttle control.

AIR PUMP SHIFT

Pump shift engagement should be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab. A manual back-up shift control should also be located on the driver’s side pump panel.

Two (2) indicator lights should be provided adjacent to the pump shift inside the cab. One (1) green light should indicate the pump shift has been completed and be labeled "pump engaged". The second green light should indicate when the pump has been engaged and the chassis transmission is in pump gear. This indicator light should be labeled "OK to pump".

Another green indicator light should be installed adjacent to the hand throttle on the pump panel and indicate either the pump is engaged and the road transmission is in pump gear, or the road transmission is in neutral and the pump is not engaged. This light should be labeled "Warning: Do not open throttle unless light is on".

The pump shift control in the cab should be illuminated to meet NFPA requirements.

TRANSMISSION LOCK-UP

The direct gear transmission lock-up for the fire pump operation should engage automatically when the pump shift control, in the cab, is activated.

AUXILIARY COOLING SYSTEM

A supplementary heat exchange cooling system should be provided to allow the use of water from the discharge side of the pump for cooling the engine water. Heat exchanger should be cylindrical type and should be a separate unit. It should be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger should be plumbed to the master drain valve.

INTAKE RELIEF VALVE

An Elkhart relief valve should be installed on the suction side of the pump preset at 125 psig.

Relief valve should have a working range of 75 psig to 250 psig.

Outlet should terminate below the frame rails with a 2.50" National Standard hose thread adapter and should have a "do not cap" warning tag.

Control should be located behind an access door at the right (passenger's) side pump panel.

PRESSURE CONTROLLER

A Fire Research, INCONTROL Model TGA300 pressure governor should be provided.

A pressure transducer should be installed in the water discharge manifold on the pump.

The display panel should be located at the pump operator's panel.

HALE ESP PRIMING PUMP

Priming pump should be a positive displacement vane type, electrically driven, and conforming to standards outlined in NFPA pamphlet #1901.

One (1) priming control should both open the priming valve and start the priming motor.

A fluid tank should automatically lubricate and seal the sliding rotor vanes, when the pump operates.

Priming reservoir should be translucent to indicate the proper fluid level. It should be accessible through an inspection door on the right (passengers) side of the apparatus.

RECIRCULATING LINE
A .50" diameter recirculating line, from the pump to the water tank, should be furnished with a control installed at the pump operator's control panel.

PUMP DRAIN LOCATION
The master pump drain should be located so that the drain or the drain lines do not interfere with Access to the pump transmission fill plug.

RADIATOR REFILL, w/RESTRICTION
An emergency radiator refill line should be provided, with the control accessible through a stainless steel door on the passenger side pump panel. A .063" restriction should be provided in this line to prevent pressurizing the radiator.

THERMAL RELIEF VALVE
A thermal protection device should be included on the pump that monitors pump water temperature and opens to relieve water to cool the pump.

The thermal protection device should be set to relieve water when the temperature of the pump water exceeds 120o F (49 C).

The thermal protection device should include an indicator light and audible buzzer.

The components of the thermal protection device should be manufactured of brass and stainless steel and be compatible with most foam concentrates.

The thermal protection device should have 1-1/4 inch NPT threads for easy adaptability to existing pump discharge openings. The discharge line should be 3/8 inch diameter tubing vented to atmosphere or back to the booster tank.

The thermal protection device should have a hydrostatic test rating of 600 PSIG (41 BAR).

PUMP MANUALS
Two (2) pump manuals from the pump Manufacturer should be furnished in compact disc format with the apparatus. Manuals should cover pump operation, maintenance, and parts.

PLUMBING
All inlet and outlet plumbing, 3.00" and smaller, should be plumbed with either stainless steel pipe or synthetic rubber hose reinforced with high-tensile

polyester braid. If hose is used, it must have a minimum burst rating of 1,000 psi and be equipped with high pressure couplings. Larger inlets and outlets should be threaded or welded black iron pipe. Small diameter secondary plumbing such as drain lines should be stainless steel, brass or hose.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping should be equipped with victaulic or rubber couplings.

All lines to drain through either a master drain valve or should be equipped with individual drain valves. All individual drain lines for discharges should be extended with a hose to drain below the chassis frame.

All water carrying gauge lines should be of flexible polypropylene tubing.

MAIN PUMP INLETS

A 6.00" pump manifold inlet should be provided on each side of the vehicle. The suction inlets should include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

The main pump inlets should have National Standard Threads with a long handle chrome cap.

The cap should be the vented type design to automatically relieve stored pressure in the line when disconnected.

SHORT SUCTION TUBE

The suction tubes on the midship pump should have "short" suction tubes to allow for installation of adapters without excessive overhang.

VALVES

All ball valves should be Akron Brass in-line valves. The Akron valves should be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

Valves should have a ten (10) year warranty.

INLET (Left side)

On the left side pump panel should be one (1) 2.50" auxiliary suction, terminating in 2.50" National Standard Hose Thread. The auxiliary suction should be provided with a strainer, chrome swivel and plug.

INLET (Right side)

On the right side pump panel should be one (1) 2.50" auxiliary suction, terminating in 2.50" National Standard Hose Thread. The auxiliary suction should be provided with a strainer, chrome swivel and plug.

The location of the valve for the one (1) inlet should be behind the pump panel.

INLET CONTROL

Control for the side auxiliary inlet(s) should be located at the inlet valve.

INLET (Rear)
A 5.00" inlet rear inlet with screen should be provided using 5.00" piping and a 5.00" butterfly valve.

Screen should provide cathodic protection against corrosion in piping.

Piping should contain only large radiused elbows, no mitered joints.

The plumbing should be routed to the rear through the water tank. The inlet should terminate at the back of the passenger's side rear compartment bulkhead. The pipe should exit the rear water tank inside the rear tailboard compartment and route through the side wall to the passenger's side compartment. Piping should be connected to the passenger's side main inlet side of the Q-Max pump.

A bleeder valve should be located at the threaded connection. **(Photo provided)**

ADAPTER, REAR INLET
The rear 5.00" inlet should be furnished with a 5.00"(F) National Standard hose thread x 5.00" Storz elbow adapter with a Storz cap.

CONTROL, REAR INLET
The rear suction should be gated with an electric operated control at the pump operator's panel. The control should be momentary to allow the valve to be gated for ease of operation. Indicator lights should be provided to show if the valve is open or closed.

INTAKE RELIEF VALVE
An intake relief valve, preset at 125 psig, should be installed on the inlet side of the valve.

Relief valve should have a working range of 75 psig to 250 psig.

Outlet should terminate below the frame rails.

A .75" bleeder should be provided.

INLET BLEEDER VALVE
A .75" bleeder valve should be provided for each side gated inlet. The valves should be located behind the panel with a swing style handle control extended to the outside of the panel. The handles should be chrome plated and provide a visual indication of valve position. The swing handle should provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeders should be routed below the chassis frame rails.

TANK TO PUMP
The booster tank should be connected to the intake side of the pump with heavy duty piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator's panel. Tank to pump line should run straight

(no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling should be included in this line to prevent damage from vibration or chassis flexing.

A check valve should be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.

TANK REFILL
A 1.50" combination tank refill and pump re-circulation line should be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

DISCHARGE OUTLETS (Left Side)
There should be two (2) discharge outlets with a 2.50" valve on the left side of the apparatus, terminating with a male 2.50" National Standard hose thread adapter.

DISCHARGE OUTLETS (Right Side)
There should be one (1) discharge outlet 2.50" valve on the right side of the apparatus, terminating with a male 2.50" National Standard hose thread adapter.

DISCHARGE OUTLET, 4.00"
There should be a 4.00" discharge outlet with a 4.00" Akron valve installed on the right side of the apparatus, terminating with male a 4.00" National Standard hose thread. The discharge outlet should be actuated with a handwheel control and position indicator at the pump operator's control panel.

DISCHARGE OUTLET (Front)
There should be a 1.50" gated discharge outlet plumbed to the lower portion of the tray in the passenger side front bumper extension. The outlet should be to the right side near the bottom in the selected tray.

The discharge should have a 90-degree swivel and terminate with 1.50" NHT.

Plumbing should consist of 2.00" piping with a 2.00" full flow ball valve controlled at the pump operator's panel.

Automatic drains should be provided at all low points in the plumbing.

DISCHARGE OUTLET (Rear)
There should be two (2) discharge outlets piped to the rear of the hose bed, on one (1) each side, installed so proper clearance is provided for spanner wrenches or adapters. Plumbing should consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel.

DISCHARGE CAPS
Chrome plated, rocker lug, caps with chains should be furnished for all side discharge outlets.

The caps should be the vented type design to automatically relieve stored pressure in the line when disconnected.

OUTLET BLEEDER VALVE

A .75" bleeder valve should be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

The valves should be located behind the panel with a swing style handle control extended to the outside of the side pump panel. The handles should be chrome plated and provide a visual indication of valve position. The swing handle should provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders should be located at the bottom of the pump panel. They should be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders should be routed below the chassis frame rails.

ELBOWS, LEFT SIDE OUTLETS

The 2.50" discharge outlets, located on the left side pump panel, should be furnished with a 2.50"(F) National Standard hose thread x 2.50"(M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow should be the vented type design to automatically relieve stored pressure in the line when disconnected.

ELBOWS, RIGHT SIDE OUTLETS

The 2.50" discharge outlets, located on the right side pump panel, should be furnished with a 2.50"(F) National Standard hose thread x 2.50"(M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow should be the vented type design to automatically relieve stored pressure in the line when disconnected.

ELBOWS, REAR OUTLETS

The 2.50" discharge outlets, located at the rear of the apparatus, should be furnished with a 2.50"(F) National Standard hose thread x 2.50"(M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be the vented type to automatically relieve stored pressure in the line when disconnected.

ELBOW, 4.00" OUTLET

The 4.00" outlet should be furnished with a 4.00"(F) National Standard hose thread x 5.00" Storz elbow adapter with Storz cap.

DISCHARGE OUTLET CONTROLS

The discharge outlets should incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism should indicate the position of the valve.

If a handwheel control valve is used, the control should be a minimum of a 3.9" diameter chrome plated handwheel with a dial position indicator built in to the center of the handwheel.

DELUGE RISER

A 3.00" deluge riser should be installed above the pump in recessed with top of Extend-a-Gun approx. flush w/ side sheet, in such a manner that a monitor can be mounted and used effectively. Piping should be installed securely so no movement develops when the line is charged. The riser should be gated and controlled by a handwheel at the pump operator's panel.

TELESCOPIC PIPING

The deluge riser piping should include a 18.00" Task Force Model XG18 Extend-A-Gun extension.

This extension should be telescopic to allow the deluge gun to be raised 18.00" increasing the range of operation.

A position sensor should be provided on the telescopic piping that should activate the "do not move vehicle" light inside the cab when the monitor is in the raised position.

The deluge riser should have male National Pipe Threads for mounting the monitor.

CROSSLAY HOSE BEDS, 1.50"

Three (3) crosslays with 1.50" outlets should be provided. Each bed to be capable of carrying 250' of 1.75" each and should be plumbed with 2.00" i.d. (inside diameter) pipe and gated with a 2.00" quarter turn ball valve.

Outlets to be equipped with a 1.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay controls should be at the pump operator's panel.

The center crosslay dividers should be fabricated of .25" aluminum and should provide adjustment from side to side. The divider should be unpainted with a brushed finish.

Vertical scuffplates, constructed of stainless steel, should be provided at the front and rear ends of the bed on each side of vehicle.

Crosslay bed flooring should consist of removable perforated brushed aluminum.

CROSSLAY/DEADLAY HOSE RESTRAINT

There should be a one (1) piece red vinyl cover provided across the top and each end of three (3) crosslay/deadlay(s) to secure the hose during travel. The vinyl top should be attached at the front and rear of the crosslay/deadlay(s) with Velcro fasteners. Each vinyl end flap should have 1.00" web straps that loop

through footman loops at the bottom of the crosslay/deadlay(s) and fasten with cam clip fasteners.

LOWERED CROSSLAYS

The crosslays should be lowered so that the bottom of crosslays should be no higher than 72" or lower from ground. The crosslay nearest the cab should not interfere with the push- up lights mounted on the rear of cab.

PUMP COMPARTMENT

The pump compartment should be separate from the hose body and compartments so that each may flex independently of the other. It should be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

The pump compartment should be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist.

Pump compartment, pump, plumbing and gauge panels should be removable from the chassis in a single assembly.

PUMP MOUNTING

Pump should be mounted to a substructure which should be mounted to the chassis frame rail using rubber isolators. The mounting should allow chassis frame rails to flex independently without damage to the fire pump. Please describe in detail your pump house mounting to frame. A test document on designed should be provided with bid.

PUMP CONTROL PANELS (Side Control)

All pump controls and gauges should be located at the left (driver's) side of the apparatus and properly marked.

The pump panel on the right (passenger's) side is removable with lift and turn type fasteners. The left (driver's) side is fastened with screws.

The control panels should be 48.00" wide.

The gauge and control panels should be two (2) separate panels for ease of maintenance.

The side gauge panel should be hinged at the bottom with a full length stainless steel hinge. The fasteners used to hold the panel in the upright position should be quarter turn type. Vinyl covered cable or chains should be used to hold the gauge panel in the dropped position.

Polished stainless steel trim collars should be installed around all inlets and outlets.

All push/pull valve controls should have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods should be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls should be capable of locking in any

position. The control rods should pull straight out of the panel and should be equipped with universal joints to eliminate binding.

The identification tag for each valve control should be recessed in the face of the tee handle.

All discharge outlets should have color coded identification tags, with each discharge having its own unique color. Color coding should include the labeling of the outlet and the drain for each corresponding discharge.

All line pressure gauges should be mounted in individual chrome plated castings with the identification tag recessed in the casting below the gauge. All remaining identification tags should be mounted on the pump panel in chrome plated bezels. Mounting of the castings and identification bezels should be done with a threaded peg cast on the back side of the bezel or screws.

PUMP PANEL CONFIGURATION

The pump panel configuration should match existing units. Fire department will provide photos of existing in service units.

PUMP AND GAUGE PANEL

The pump and gauge panels should be constructed of black vinyl covered aluminum, to allow easy identification of the gauges and controls and to eliminate glare.

The black vinyl should be bonded to the aluminum, by the company that supplies the product.

A polished aluminum trim molding should be provided around each panel.

The passenger's side pump panel should be removable and fastened with swell type fasteners.

- A pump RPM test port

PUMP COMPARTMENT LIGHT

A pump compartment light should be provided inside the right side pump enclosure and accessible through a door on the pump panel.

A .125" weep hole should be provided in each light lens, preventing moisture retention.

Engine monitoring graduated LED indicators should be incorporated with the pressure controller.

AIR HORN BUTTON

An air horn control button should be provided at the pump operator's control panel. This button should be red in color and properly labeled and put within easy reach of the operator.

COLOR CODED GARNISH RINGS
A color coded garnish ring should be furnished around each driver side, passenger side rear and front discharge outlet. The color of the ring should match the color on the discharge control and should consist of a vinyl overlay on the stainless steel garnish ring.

SPECIAL LABEL
There should be one (1) special label/s provided and installed. The Tank fill and Recirculation tag should read "Tank Fill" only.

COLOR CODED NAME TAGS
There should be five (5) outlet discharges with special color coded name tags. These tags should be used for labeling the discharge pressure gauges, controls, outlets and drains. frt. discharge (orange), #1 x-lay (yellow), #2 x-lay (red), #3 x-lay (blue), DS rear discharge (green) - Note color coded garnish rings to match tag colors.

GAUGES, VACUUM and PRESSURE
The pump vacuum and pressure gauges should be silicone filled and manufactured by Class 1, Inc.

The gauges should be a minimum of 6.00" in diameter and should have white faces with black lettering, with a pressure range of 30.00"-0-600#.

The pump pressure and vacuum gauges should be installed adjacent to each other at the pump operator's control panel.

Test port connections should be provided at the pump operator's panel. One should be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They should have 0.25 in. standard pipe thread connections and polished stainless steel plugs. They should be marked with a label.

PRESSURE GAUGES
The individual "line" pressure gauges for the discharges should be interlube filled and manufactured by Class 1.

The gauges should be a minimum of 3.50" in diameter and should have white faces with black lettering.

Gauges should be compound type with a vacuum/pressure range of 30.00"-0-600#.

The individual pressure gauge should be installed as close to the outlet control as practical.

WATER LEVEL GAUGE
A Fire Research, Model WL2000 series electric water level gauge should be provided on the operator's panel, that registers water level by means of 9 LEDs. They should be at 1/8 level increments with a tank empty LED. The

LEDs should be a bright type that is readable in sunlight, and have a full 180 degree of clear viewing.

To further alert the pump operator, should have a warning flash when the tank volume is less than 25%, and should have "Down Chasing LEDs when the tank is almost empty.

The level measurement should be ascertained by sensing the head pressure of the fluid in the tank or cell.

WATER LEVEL GAUGE, CAB SIDES

There should be two (2) additional water level indicator, Whelen Model: PSTANK, LED module, installed one (1) each side of cab.

This light module should include four (4) colored levels, and function similar to the water level indicator located at the operators panel:

- First green module indicates a full water level.
- Second blue module indicates a water level above 3/4 full.
- Third amber module indicates a water level above 1/2 full.
- Last red module indicates a water level above 1/4 full and empty.
    - Above 1/4 this light should be steady burning.
    - At empty this light should be flashing.

This module should be activated when the pump is in gear.

STEP/LIGHT SHIELD

The pump panel controls and gauges should be illuminated by incandescent lights installed under an aluminum diamond plate combination step/light shield. The stepping surface should be a minimum of 8.00" deep and properly reinforced to support a man's weight.

Illumination should be provided for controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus and the equipment provided on it. External illumination should be a minimum of five (5) foot-candles on the face of the device. Internal illumination should be a minimum of four (4) foot lamberts.

A light should come on above the pump panel light switch when the parking brake is set. This is to afford the operator some illumination when first approaching the control panel. A green pump engaged indicator should come on at the operator's panel when the pump is shifted into gear from inside the cab. One (1) pump panel light should also come on when the pump is shifted into gear from inside the cab. The remaining lights to be actuated from a switch located on the pump panel.

One (1) Weldon, Model 9186-23882-30, step light should be provided. The step light should be installed as to illuminate the top of the step for night time vision. The step light should be activated by the pump panel light switch.

An additional step/light shield should be provided above passenger's side pump panel. The pump panel should be illuminated by incandescent lights installed under a bright aluminum tread plate step.

The step should have a minimum of an 8.00" stepping surface and it should be properly reinforced to support a man's weight.

The lights should be operated from a switch on the pump panel.

One (1) Weldon, Model 9186-23882-30, step light should be provided. The step light should be installed as to illuminate the top of the step for night time vision. The step light should be activated by the pump panel light switch.

AIR HORN SYSTEM
Two (2) Grover air horns should be provided and located, in the front bumper, recessed one (1) each side of hose tray. The horn system should be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve should be installed in-line to prevent loss of air in the air brake system.

AIR HORN CONTROL
The air horns should be actuated by two (2) foot switches.

One (1) foot switch should be located on the officer's side passenger side outboard location and one (1) foot switch should be located on the driver's side driver side standard location.

ELECTRONIC SIREN
A Federal, model 690001, PA-300-012MSC, electronic siren should be provided.

ELECTRIC SIREN, LOCATION,
Siren head should be mounted overhead officer side.

SIREN CONTROL
The electronic siren should be controllable on the siren head and horn ring only. No foot switches should be required. In addition it should be tied to the Parking Brake deactivating electronic siren.

The driver should have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

SPEAKER
There should be one (1) speaker provided. Each speaker should be a Federal, model CP100-S, 100 watt, with chrome finish. Each speaker should be connected to the siren amplifier.

The speaker(s) should be mounted on top of the front bumper on the passenger's side.

MECHANICAL SIREN, (Auxiliary)
A Federal Q2B siren should be furnished. A siren brake button should be installed on the switch panel.

The control solenoid should be powered up after the emergency master switch is activated.

The mechanical siren should be mounted on the bumper deck plate. It should be mounted on the left side. The siren mounting should include a reinforcement plate.

MECHANICAL SIREN SWITCHING

The mechanical siren should be actuated by two (2) foot switches located driver side standard location, passenger side outboard location.

INTERLOCK, ELECTRONIC SIREN

The electronic siren should be interlocked to shut off when the parking brake is set.

LIGHTBAR, CAB ROOF

There should be a 72.00"Whelen Freedom Model FN**QLED lightbar mounted on the cab roof.

The lightbar should include the following:

- Four (4) red flashing LED modules facing forward.
- Two (2) white flashing LED modules facing forward.
- Two (2) red flashing corner LED modules, one in each front corner.
- One (1) red flashing LED module facing the rear corner driver's side.
- One (1) red flashing LED module facing the rear corner officer's side.

All lenses should be clear.

There should be one (1) switch located in the cab on the switch panel to control this lightbar.

The white warning lights should be disabled when the parking brake is applied.

The two (2) red flashing LED modules facing forward may be load managed when the parking brake is applied.

WARNING LIGHTS (Cab Face)

Two (2) pair of Whelen model 60*00F*R LED lights should be installed on the cab face, above the headlights, mounted in a common bezel.

The outer LEDS should be required for NFPA and should meet or exceed the NFPA required light output for the front lower zone.

The color of these LEDs should be red Super LED/red lens.

The inner LEDs should be additional lighting.

The color of these lights should be red Super LED/red lens.

Both sets of lights should be activated by the same switch in the cab.

SIDE ZONE LOWER LIGHTING

Six (6) Whelen model 60*02F*R flashing super LED lights should be located at the following positions:

Two (2) lights, one (1) each side on the bumper extension - red Super LED/red lens each side recessed into the bumper extension.

Two (2) lights, rear of crew cab doors - red Super LED/rd lens each side.

Two (2) lights, body wheel well - red Super LED/red lens each side.

The lights should be controlled by a lighted switch on the cab instrument panel.

These lights should be installed with three (3) pairs of flange kits.

REAR ZONE LOWER LIGHTING

Two (2) Whelen model 60*02F*R flashing "Super" LED warning lights should be located at the rear of the apparatus, required to meet or exceed the lower level optical warning and optical power requirements of NFPA.

The color of these lights should be red Super LED/red lens.

One (1) switch in the cab on the switch panel should control these lights.

These lights should be installed with a flange.

WARNING LIGHTS (Rear of Hose Bed)

Two (2) Whelen L31H*FN LED warning beacons should be provided at the rear of the truck, located one (1) each side. These lights should be activated by a lighted switch on the instrument panel.

The color of the lights should be red LEDs with both domes red.

The rear warning lights should be mounted on top of the compartmentation with all wiring totally enclosed. The rear deck lights should be mounted on the beavertails high as possible.

TRAFFIC DIRECTING LIGHT

There should be one (1) Whelen model TAL65 36.01" long x 2.84" high x 2.24" deep, amber LED traffic directing light installed at the rear of the apparatus.

The Whelen model TACTLD1 control head should be included with this installation.

The auxiliary warning mode should be activated with the control head only.

This traffic directing light should be recessed with a stainless steel trim plate at the rear of the apparatus as high as practical.

The traffic directing light controller should be located within the switch panel in the dashboard. The controller should be within easy reach of the driver.

LOOSE EQUIPMENT

The following equipment should be furnished and mounted with the completed unit:

1400' of 5" All American Hose Triple Duty, YELLOW with Storz couplings in 100' lengths
300’ of 2.50” FQ Combat Master Flow hose, BLUE with NH cplng in 50’ lengths
150’ of 2.50” FQ Combat Master Flow Ultra Light Hi Rise hose, with NH cpling in 50’ lengths
900’ of 2.50” FQ Combat Master Flow hose, TAN with NH cplng in 50’ lengths
150’ of 1.75” FQ Combat Master Flow hose, ORANGE with NH cplng in 50’ lengths
250’ of 1.75” FQ Combat Master Flow hose, BLUE with NH cplng in 50’ lengths
200’ of 1.75” FQ Combat Master Flow hose, YELLOW with NH cplng in 50’ lengths
200’ of 1.75” FQ Combat Master Flow hose, RED with NH cplng in 50’ lengths
150’ of 1.75” FQ Combat Master Flow hose, LIME YELLOW with NH cplng in 50’ lengths
25' of 5" All American Hose Triple Duty, hose with Storz couplings
50' of 5" All American Hose Triple Duty, hose with Storz couplings
250’ of 1.00” Key forestry hose single jacket in 50’ sections w R & B bag
20’ of 2.50” Key hose with/(NH) couplings
Four (4) Elkhart #B-375-GAT, 1.50” / ball shutoff
Four (4) Elkhart #4000-14, 1.50” nozzle tip
Four (4) Elkhart Model #281A, mini stream shaper
Two (2) 2.50” Akron # 2730, turbojet with playpipe
Two (2) 2.50” Akron 2393 Playpipes with shutoff
One (1) 1” Akron # 1030 Forestry Nozzle
One (1) 2.5" TFT UE-095-NJ-NF, Foam Eductor (95 GPM)
One (1) Akron #2423, Apollo Deck Gun, stack tips and fog
One (1) TFT # XX111A Biltz Fire monitor with mounts
One (1) Akron #535, Cellar Nozzle
One (1) TFT AA1ST-NP Storz adapter, 5” ST rigid X 4.50” NH (F)
One (1) TFT AA2ST-NJ, Storz adapter, 5" ST rigid X 2.5" NH (M)
One (1) TFT AA1SF-NJ,Storz adapter, 5" ST rigid X 2.5"NH (F) RL rigid
One (1) TFT A01ST, Storz blind cap
One (1) TFT AB3ST-NX, Piston Intake Ball valve 5.00” Storz x 6.00” NH (F)
One (1) TFT AA4ST-SP 4”Storz rigid X 5” Storz rigid
One (1) TFT AA3HST-NR, Storz, 5" ST swivel X 4.5" NH (F) LHSW
One (1) TFT A3810 Jumbo Spanner Wrench with Bracket
One (1) Humat 4-way hydrant valve 4.5" NH (F) X (3) 5" Storz
One (1) TFT A3820, Hose Roller
One (1) Red Head 37, .5" X 1.5" Reducer
One (1) Red Head 37, 2.5” x 1” Reducer
One (1) Red Head 37, 1.5” x 1” Reducer

One (1) Red Head 35, 2.5" double female adapters

One (1) Red Head 36, 2.5" double male adapters

One (1) Hose Clamp, Akron # 588

One (1) TFT A02HNX, Barrel Suction strainer

One (1) Robwen Low Expansion 95 gpm-1.5”NST Nozzle

One (1) R & B 442RD, Hydrant tool bag, 24"L X 12" W X 9" high, Red

One (1) Akron 2.5" Hose jacket

One (1) Akron #1581P, 2 ½” X 1 ½” gated wye

One (1) Akron #2285P, gate valve

One (1) Akron PHY-6, Pick Head axe with mounts

One (1) Akron PHY-6, Flat Head Axe

One (1) KT Pro-Par, Halligan tool (single forged)

One (1) Married Set Pack Tool Mount (for Halligan Bar and Flat Head Axe above.)

One (1) Akron UL-8, 8ft. Pike pole

One (1) Akron ARH-48S, Roof Hook with strap with 4’ metal handle with “D” with mount

One (1) Akron UL-6, 6 ft Pike Pole

One (1) Akron AS-27D, Scoop Shovel

One (1) Akron RS-48F, Round Point Shovel

One (1) Akron PPB-36, 36” Pinch Point Bar with mounts

One (1) Akron FSY-10, 10# Sledge Hammer with mounts

One (1) WF&S, Bail hooks

Two (2) Gemtor 571, Hose straps

One (1) WF&S, PW 24, 24” Pipe wrench

One (1) WF&S, WK, Water Key with mount

One (1) FHU BC-36, 36” bolt cutter with mounts

Five (5) BECO SP-50, Sprinkler stops

Five (5) SL-44451, Streamlight Fire Vulcan lights with 12 volt chargers

Three (3) #90509 Streamlight Survivor lights with 12 volt chargers

One (1) Amerex A411, Dry chemical extinguisher with mounts

One (1) Amerex 240, 2.5 gallon water extinguisher with straps and mounts

One (1) Amerex 331, CO2 Extinguisher with mounts

Five (5) SCBA, Scott X3 4500 PSI w/, Duel EBSS, quick connect regulator Pak Tracker # X3314022200302

Ten (10) Scott SCBA Scott spare 4500 carbon cylinders (45 minutes) #804722-01

Five (5) Scott AV 3000 HT mask with right side communications bracket Medium # 201215-05

Six (6) Red Head 101, Combination spanner wrenches

Two (2) Red Head 105, Hydrant wrenches with standard and locking

One (1) FHU CM-2, Rubber Mallet

One (1) FHU HR-1, Hydra-Ram Tool

One (1) Tool Box-Claw hammer, Flat bar, 25’ tape measurer, Phillips screw driver, Flat screw driver, Standard adjustable pliers, Adjustable wrench 15/16, Linemen’s pliers, Socket set standard and metric, Set of open end wrenches, Battery terminal puller.

One (1) FHU EKS-12, Set of elevator keys

Two (2) FDT SC12X18, 12X18 salvage covers

Five (5) non- collapsible 24 inch traffic cones with reflective white band

One (1) Zoll AED Pro- Semi-Auto Only. Part # 90110400499991010

Includes: Backlit LCD screen, soft carry case, rugged over-molded outer housing, multi-patient internal memory, IrDA port, operation guide, five (5) year factory warranty, limited lifetime outer housing warranty

SurePower Rechargeable Lithium Ion Battery Pack Part # 8019-0535-01

- 5.8 Ah Capacity
- High density lithium ion chemistry
- RunTime Indicator
- Automatic calibration ready
- Stores history of use and maintenance

Single Bay Charger for the SurePower and SurePower II

Batteries part# 8200-000100-01

Two (2) batteries for Zoll AED Pro-Semi-Auto Only.

One (1) MSA Part # 10145951- Evolution 6000 Plus Thermal Imaging Camera Only. Features to include: laser range finder (feet), laser pointer, degrees F, 2x/4x zoom, color palettes, compass)

One (1) MSA Part # 10145771- Evolution 6000 Thermal Imaging Camera Vehicle Kit (includes 2 rechargeable batteries, vehicle charger, retractable lanyard, and carabiner)

One (1) Multi Rae Complete Vehicle Mounting Kit REA-M01-0308-00

One (1) Multi Rae Automotive Charging adapter (12V) #RAE-003-3004-000

One (1) Multi Rae-Lite 5-Gas Detector # RAE-MAB3-01C127E-020 Monitor with internal pump, sensors(LEL,O2,CO,HCN and H2S) ,rechargeable battery, Li-on PC communication cable, AC/DC wall adapter ,alkaline battery adapter, calibration adapter, hex tool, quick start guide, Pro Rae Studoil, calibration and test certificate, warranty card, built in pump, belt clip, (3) spare filters

One (1) Roll of Ph paper

One (1) Radeye G Holster

One (1) Radeye G (Yellow with 3 year Enhanced Depot Service Warranty)

One (1) set of Bass Pro Shop 38-872-750-00 Binoculars, 7X50 Steiner

Two (2) sets of Grainger 2AAG5 ear muffs

Two (2) Ziamatic SAC-44-E wheel chocks with brackets (under body mounts)

Five (5) RT 350632, Life vest

One (1) RT 460008, Life ring

One (1) PMI KT 36023, Water rescue throw bag

One (1) PMI RR125 W0046E, Utility rope (150') w/RB44011 bag

One (1) 200ft Yellow Rescue Rope PMI Classic 12. 5 mm RR125YW092E w/ RB44011 bag

Two (2) Ansul 3X3 Low Viscosity, AR-AFFF foam 5 gal. 3%

One (1) 4' "D" Handle Pike Pole

Two (2) Red Head SMP-50, 5.00" Storz mounting plates

Seven (7) Southpark 2 ½" Trilocks

One (1) Storage box (Map Box) mounted behind driver seat in crew cab area to match existing units. Box is made of aluminum. Size 20"x 20" x 8.5"H with 5 partitions inside box

One (1) Humat Strap

Two (2) set of TFT 5.00" jumbo spanner wrenches

One (1) R&B #443 High Rise Bag with:

- One (1) Firequip DJ25Wx 2.5"x10' White DJ800 Hose
- One (1) Kochek 21K25252 2.5" x (2) 2.5" Gated Wye
- One (1) Red Head Style 37 Red Head 2.5" x 1.5" Reducer
- One (1) Elkhart 105A 2.5" Aluminum High Rise Elbow Drain
- Three (3) Red Head 14084 2.5" Swivel Gaskets
- Two (2) Kochek 2.5" Spanner Wrenches
- Two (2) TeleLight Sprinkler Stop Valves
- Three (3) Elkhart O1560001 Model 632 Hose & Ladder Straps
- One (1) Firehooks Unlimited EKS-12 Elevator Key Set
- One (1) Elkhart OO695541 DB-375-GA 2.5" x 1.5" Shut-off with Pistol Grip
- One (1) Elkhart OO625301 Dual Stack Tips, (Indianapolis Style) 1 1/8" & 1 ¼" tips
- Two (2) Large Rubber Door Wedges

Three (3) Straps for Hi-Rise Bag (on-e R&B HS-150, one HS-100, one HS-50)

One (1) Metal Bucket

One (1) Vinagrip or Dri Deck matting to be installed each shelf and compartment floor.

One (1) Power point added behind drivers seat

One (1) Water cooler, Grainger #6YG04

One (1) Stainless steel plate on the back of the truck behind the Humat valve

Two (2) Lightweight Hard Suctions

One (1) 2.50" x 1.50" Reducer

Five (5) Motorola APX6000XE Single Band Portable Radio Model

H98UCH9PW7N APX6000XE Single Band Portable Radio
QA02006 XE Upgrade Rugged
H64 Colored Housing Public Safety Yellow
Q806 Astro Digital
H38 Smartzone Operation
Q361 P25 9600 Baud Trunking
QA00583 Enable Bluetooth
QA01749 ASK-Software Key
H869 Multikey Encryption
Q15 AES/DES, DES-XL, DES-OFB Encryption
H885BK 2 Year Repair Service Advantage
HMN4104A Impres RSM Disp. W/Jack, Chan.
NNTN8092 Extra Battery 2300Mah LI-ION FM

APX6000 XE Radio Leather Straps and Cases

Five (5) Radio Tech APX600 Full Keypad Case # RTMAPX6000F

Five (5) Radio Tech Communicator Radio Strap # RTCOM100
Five (5) Radio Tech Anti- Sway Stabilizer 9" # RTSTAB100

APX6500 Mobile Radio (1 Each)
M25URS9PW1N APX6500 7/800MHz Mobile
G806 Astro Digital CAI
G51 Smartzone Operation
QA01749 Advance System Software Key
G361 P25 9600 Baud Trunking
G442 APX05 Control Head
G44 Control Head Software
G67 Remote Mount
G174 3db Low Profile Antenna
W22 Palm Mic
G831 15W Water Resistant Speaker
G24 2 Year Repair Service Advantage

One (1) Motorola Mobile Radio Equipment Listed Below Note Radio Should Be Mounted be delivery

MDT Dock
Manufacturer to install a PMT RF dual- pass thru (WLAN/WWAN) Vehicle Dock with port replication. Includes 12-32 VDC vehicle adapters. Part number B-RFVDKPMT-CH for a GETAC B300 computer
MDT mount will be provided with an external antenna as listed below:
AP-Cell/PCS/LTE/Wi-Fi Antenna. Threaded Bolt Mount in large teardrop housing.15 feet RG-58U coax with TNC connector on Wi- Fi Color Black. Part number AP-CW-Q-S11-BL

ALL ITEMS SHOULD BE INSTALLED PER CUSTOMER DIRECTION.

PAINT
The cab should be two-tone, with the upper section painted Black #101 along with a shield design on the cab face and lower section of the cab and body painted Red #80.

PAINT CHASSIS FRAME ASSEMBLY
The chassis frame assembly should be painted black before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc. Components that are included with the chassis frame assembly that should be painted black are frame rails, cross members, axles, suspension, steering gear, fuel tank, body substructure supports, miscellaneous mounting brackets, etc.

PAINT, COMPARTMENT INTERIOR
Interior of compartmentation should be painted with a gray spatter type paint.

REFLECTIVE STRIPES
Three (3) reflective stripes should be provided across the front of the vehicle and along the sides of the body. The reflective band should consist of a 1.00"

gold stripe at the top with a 1.00" gap then a 4.00" white stripe with a 1.00" gap and a 1.00" gold stripe on the bottom.

The reflective vinyl band should be provided across the front bumper.

CHEVRON STRIPING, REAR

There should be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The rear surface, excluding the rear compartment door, should be covered.

The colors should be red and yellow diamond grade.

Each stripe should be 6.00" in width.

This should meet the requirements of NFPA 1901, 2009 edition, which states that 50% of the rear surface should be covered with chevron striping.

JOG(S) IN REFLECTIVE BAND

The reflective band located on each side of the apparatus body should contain one (1) jog(s) and should be angled at approximately a 45 degree "s" when installed.

OUTLINE, REFLECTIVE STRIPE

A Black outline should be applied on the top and the bottom of the reflective band. There should be three (3) set of outline stripes required.

REFLECTIVE STRIPE INSIDE RUBRAILS

A white reflective stripe should be provided inside the extruded aluminum rubrails or on the outside centered on the stainless steel rubrails.

REFLECTIVE STRIPE ON FRONT BUMPER

There should be a yellow diamond grade and a red diamond grade reflective stripe provided on the front face of the front bumper. The striping should consist of a series of 6.00" Chevron stripes with .25" black vinyl on seams.

CHEVRON/INVERTED "V" STRIPING ON CAB AND CREW CAB DOORS

There should be alternating chevron striping located on the inside of each cab and crew cab door. The striping should consist of a 6.00" wide yellow diamond grade stripe with a 2.00" red diamond grade stripe applied over the diamond grade material.

LETTERING

The lettering should be totally encapsulated between two (2) layers of clear vinyl.

LETTERING, GOLD LEAF

Forty-one (41) to sixty (60) genuine gold leaf lettering, 3.00" high, with outline and shade should be provided.

LETTERING, REFLECTIVE
Twenty-one (21) to forty (40) reflective lettering, 3.00" high, with outline and shade should be provided.

LETTERING, REFLECTIVE
There should be reflective lettering, 18.00" high, with outline and shade provided. There should be four (4) letters provided.

LETTERING, REFLECTIVE
There should be reflective lettering, 10.00" high, with outline and shade provided. There should be four (4) letters provided.

LETTERING, REFLECTIVE
There should be reflective lettering, 8.00" high, with outline and shade provided. There should be twelve (12) letters provided.

LETTERING VINYL SEE THRU (COMPANY PATCH)

EMBLEM
There should be two (2) vinyl emblem(s), approximately 13.00"-15.00" in size, installed crew cab windows. The emblem should be modeled after the department submitted information (art, patch, etc).

MANUAL, FIRE APPARATUS PARTS
Two (2) custom parts manuals for the complete fire apparatus should be provided in hard copy with the completed unit.

The manual should contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate a part

The manual should be specifically written for the chassis and body model being purchased. It should not be a generic manual for a multitude of different chassis and bodies.

MANUALS, CHASSIS SERVICE
Two (2) chassis service manuals containing parts and service information on major components should be provided with the completed unit.

The manuals should contain the following sections:

- Job number

- Table of Contents
- Troubleshooting
- Blink Code Definitions with Probable Causes
- Front Axle/Suspension
- Brakes
- Engine
- Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manual should be specifically written for the chassis model being purchased. It should not be a generic manual for a multitude of different chassis and bodies.

MANUALS, CHASSIS OPERATION

Two (2) chassis operation manuals should be provided.

WARRANTY

The following item(s) should be covered under warranties. The vendor is required to provide their most comprehensive warranty and information on such warranty. A copy of the warranty certificate should be submitted with the bid proposal.

Engine
Pump
Steering Gear
Chassis Structural Integrity
ABS Brake System
Front and Rear Axle Material and Workmanship
Transmission
Apparatus Body Structural Integrity
Aerial Device Structural Integrity
Aerial Swivel Warranty
Hydraulic System Components Warranty
Hydraulic Seal Warranty
Aerial Waterway Warranty
Paint and Corrosion

Specification for: **Charleston Fire Department**	Bidder Complies	
	Yes	No
Gold Leaf Lamination & Workmanship Manufactures Warranty for all Major Components		